

**Toshiba Personal Computer**  
**TECRA M4**  
**Maintenance Manual**

**TOSHIBA CORPORATION**

**File Number 960-521**

*[CONFIDENTIAL]*

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Toshiba TECRA M4 Maintenance Manual

First edition April 2005

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## Preface

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This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer TECRA M4, referred to as TECRA M4 in this manual.

The procedures described in this manual are intended to help service technicians isolate faulty Field Replaceable Units (FRUs) and replace them in the field.

### SAFETY PRECAUTIONS

Four types of messages are used in this manual to bring important information to your attention. Each of these messages will be italicized and identified as shown below.

***DANGER:*** “Danger” indicates the existence of a hazard that could result in death or serious bodily injury, if the safety instruction is not observed.

***WARNING:*** “Warning” indicates the existence of a hazard that could result in bodily injury, if the safety instruction is not observed.

***CAUTION:*** “Caution” indicates the existence of a hazard that could result in property damage, if the safety instruction is not observed.

***NOTE:*** “Note” contains general information that relates to your safe maintenance service.

Improper repair of the computer may result in safety hazards. Toshiba requires service technicians and authorized dealers or service providers to ensure the following safety precautions are adhered to strictly.

- ❑ Be sure to fasten screws securely with the right screwdriver. Be sure to use the PH Point size “0” and “1” screwdrivers complying with the ISO/DIS 8764-1:1996. If a screw is not fully fastened, it could come loose, creating a danger of a short circuit, which could cause overheating, smoke or fire.
- ❑ If you replace the battery pack or RTC battery, be sure to use only the same model battery or an equivalent battery recommended by Toshiba. Installation of the wrong battery can cause the battery to explode.

The manual is divided into the following parts:

- Chapter 1     Hardware Overview describes the Satellite R10 system unit and each FRU.
- Chapter 2     Troubleshooting Procedures explains how to diagnose and resolve FRU problems.
- Chapter 3     Test and Diagnostics describes how to perform test and diagnostic operations for maintenance service.
- Chapter 4     Replacement Procedures describes the removal and replacement of the FRUs.
- Appendices   The appendices describe the following:

- Handling the LCD module
- Board layout
- Pin assignment
- Keyboard scan/character codes
- Key layout
- Wiring Diagrams
- BIOS Rewrite Procedures
- EC/KBC Rewrite Procedures
- Reliability

## Conventions

This manual uses the following formats to describe, identify, and highlight terms and operating procedures.

### *Acronyms*

On the first appearance and whenever necessary for clarification acronyms are enclosed in parentheses following their definition. For example:

Read Only Memory (ROM)

### *Keys*

Keys are used in the text to describe many operations. The key top symbol as it appears on the keyboard is printed in **boldface** type.

### *Key operation*

Some operations require you to simultaneously use two or more keys. We identify such operations by the key top symbols separated by a plus (+) sign. For example, **Ctrl + Pause (Break)** means you must hold down **Ctrl** and at the same time press **Pause (Break)**. If three keys are used, hold down the first two and at the same time press the third.

### *User input*

Text that you are instructed to type in is shown in the boldface type below:

**DISKCOPY A: B:**

### *The display*

Text generated by the Satellite R10 that appears on its display is presented in the type face below:

```
Format complete
System transferred
```

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# Chapter 1

## Hardware Overview

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## 1.1 Features

The TECRA M4 is an ultra thin and lightweight tablet PC realizing cable-less environment on a table by wireless function with a Intel<sup>®</sup> Mobile Pentium<sup>®</sup>-M processor realizing high performance.

### ❑ Microprocessor

Microprocessor that is used will be different of the model.

#### ➤ Intel<sup>®</sup> Mobile Pentium<sup>®</sup>-M Processor

1.60GHz (Processor Number ; 730)

1.73GHz (Processor Number ; 740)

1.86GHz (Processor Number ; 750)

2.00GHz (Processor Number ; 760)

2.13GHz (Processor Number ; 770)

PPV: 0.748 to 1.308

L1 cache : 64KB (32KB(Code) + 32KB(Data))

L2 cache : 2MB

### ❑ Chipset

Equipped with Intel 915PM as North Bridge, Intel ICH6-M as South Bridge and Texas Instrument PCI7411ZHK as Card Controller.

### ❑ GPU Controller

Equipped with a nVIDIA MEP43L with 64MB/128MB.

### ❑ Memory

Two DDR2 SO-DIMM slots support DDR2 400 or DDR2 533. Memory modules can be installed to a maximum of 2GB (2,048MB). Memory modules of 256MB, 512MB and 1GB sizes are available.

### ❑ HDD

Single SATA 40/60/80/100GB internal drive. 2.5-inch x 9.5mm height



Selectable Bay

Supporting hot-swap with DVD-ROM drive, DVD-ROM & CD-R/RW drive, DVD Super Multi drive, 2<sup>nd</sup> HDD adapter and 2<sup>nd</sup> battery.

 USB FDD

3.5 inch USB FDD supports 720KB/1.44MB formats.

 Display

Display swivels automatically 0/90/180/270 degrees by display driver. LCD and CRT can be displayed at the same time.

LCD Built-in 14.1 inch, 16M colors, SXGA+ (1,400×1,050 dots), thin type low temperature poly-silicon TFT color display.

External monitor Supported via an RGB connector

Video-out Supported via an S-Video connector

 Digitizer

Digitizer is installed at the rear of LCD unit. The supplied tablet pen enables pen computing.

 Tablet pen / Reserve pen

Tablet pen / Reserve pen can be used as a mouse by touching the display softly with the pen tip. Tablet button on the side of the pen corresponds to the right click of the mouse. Erase button on the pen tail can be used as an eraser depending on the application.

 Keyboard

Keyboard has 85(US)/86(UK)-key with a pointing stick (AccuPoint) and supports Windows key and Hot key.

 Touch pad

Touch pad is installed as a pointing device.

 Batteries

The computer has two batteries: a rechargeable Lithium-Ion main battery pack and an RTC battery (that backs up the Real Time Clock and CMOS memory).

USB (Universal Serial Bus)

Three USB ports are usable. The ports comply with the USB2.0 standard, which enables data transfer speeds 40 times faster than USB1.1 standard. USB1.1 is also supported.

 PC card slot

The PC card slot (PCMCIA) accommodates one 5mm Type II card. (Based on PC Card Standard, supporting CardBus)

 SD card slot

A SD Card Slot can accommodate Secure Digital flash memory cards with various capacities. Supporting memory card and I/O card.

 Sound system

The sound system is equipped with the following features:

- Built-in stereo speakers
- Built-in monaural microphone
- Stereo Headphone jack (3.5mm mini headphone jack)
- External microphone jack (3.5mm mini microphone jack)

 Switch/Button

Windows Security tablet button, ESC/Rotation button, Cross Function button, Toshiba Application button and Wireless communication switch are available.

 Internal Modem

The internal modem is equipped as a modem daughter card (MDC).

The internal modem provides capability for data and fax communication and supports ITU-T V.90 standard. For data reception it operates at 56Kbps and for data transmission it operates at 33.6Kbps. For fax transmission, it operates at 14.4Kbps. The speed of data transfer and fax depends on analog telephone line condition. It has an RJ11 modem jack for connecting to a telephone line.

 LAN

The internal LAN supports 10/100Mbit or Gigabit Ethernet.

Wireless LAN

Wireless LAN Card can be equipped with mini-PCI slot. Based on IEEE802.11b/g, a/b/g with 2.45GHz/5.0GHz Dual-band antenna.

 i.LINK (IEEE1394)

This port enables high-speed data transfer directly from external devices such as digital video cameras.

 Docking port

Advanced Port Replicator III and Tablet Multi Dock II can be connected through docking port on the bottom.

 Infrared port

The infrared port is compatible with Fast infrared (FIR) standards enabling wireless 4 Mbps, 1.152 Mbps, 115.2 kbps, 57.6 kbps, 38.4 kbps, 19.2 kbps or 9.6 kbps data transfer with Infrared Data Association (IrDA) 1.1 compatible external devices.

 Bluetooth

The computer is equipped with Bluetooth (V1.2) communications standard that enables wireless connection between electronic devices such as computers and printers. It supports wireless communication switch.

Figure 1-1 shows the front of the computer and Figure 1-2 shows the system units configuration.



*Figure 1-1 Front of the computer*

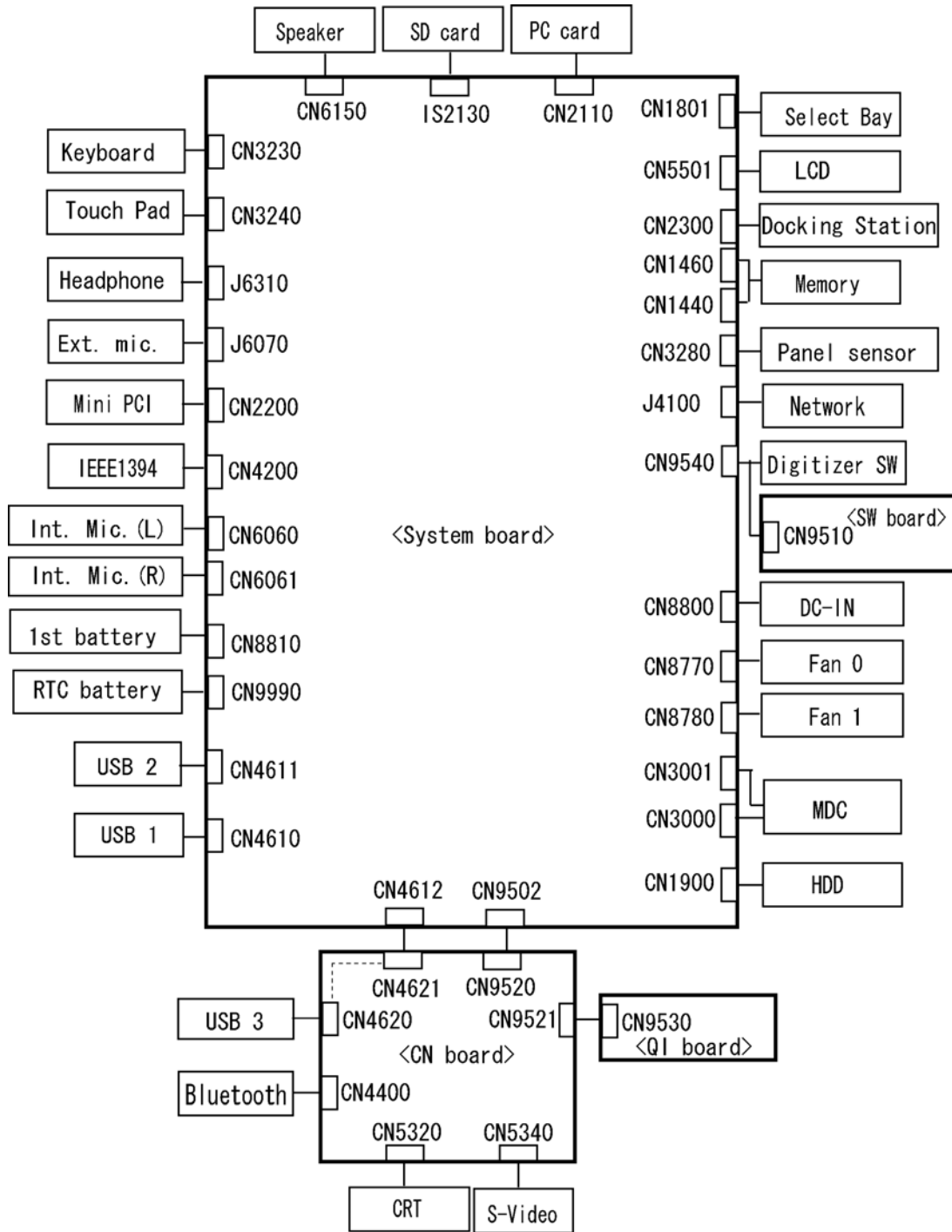


Figure 1-2 System units configuration

Figure 1-3 shows the system block diagram.

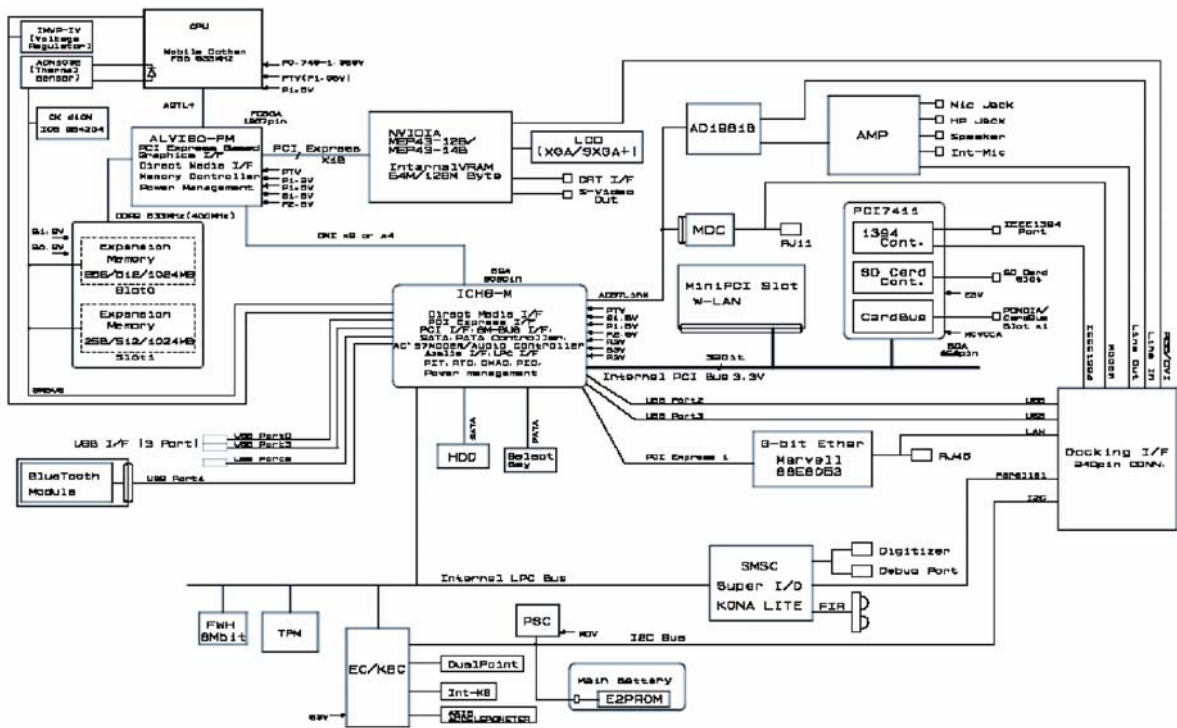


Figure 1-3 System Block Diagram

The PC contains the following components.

❑ CPU

➤ Intel® Mobile Pentium®-M Processor

1.60GHz (Processor Number ; 730)

1.73GHz (Processor Number ; 740)

1.86GHz (Processor Number ; 750)

2.00GHz (Processor Number ; 760)

2.13GHz (Processor Number ; 770)

Core voltage : 0.748 to 1.308

FSB : 533MHz

L1 cache : 64KB [32KB (Code) + 32KB (Data)]

L2 cache : 2MB

Support : Geyserville III , Deeper Sleep Mode

❑ Memory

Two DDR2 SO-DIMM slots support DDR2 400/DDR2 533 Memory modules in 256MB, 512 MB and 1GB can be installed to a maximum of 2GB (2,048MB).

1.8V operation

240 pin, SO Dual In-line Memory Modules (SO-DIMM)

Supports PC3200/PC4300

❑ BIOS ROM (Flash memory)

8Mbit

---

❑ PCI chipset

This gate array incorporates the following elements and functions

Intel 915PM (North Bridge)

- Dothan Processor System Bus Support
- System Memory Interface
- Memory Control: supports DDR333, DDR2-400/DDR2-533 2Gbmax.
- Graphics I/F: x16 PCI Express Based Graphics I/F
- DMI(Direct Media Interface)
- 1,257-ball, 40.0×37.5×2.6mm, FC-BGA package

Intel ICH6-M (South Bridge)

- DMI(Direct Media Interface)
- PCI Express I/F (4 ports)
- PCI Bus I/F Rev2.3 (7 PCI REQ/GNT Pairs)
- Integrated Serial ATA Host Controller (2 Prots,150MB/S)
- Integrated IDE Controller (Ultra ATA 100/66/33)
- AC'97 2.3 codecs
- USB 1.1/2.0 Controller 8 ports (EHCI: Enhanced Host Controller)
- Built-in LAN controller (WfM 2.0 & IEEE 802.3 compliance)
- Power Management (ACPI 2.0 compliance)
- SMBus2.0 controller
- FWH interface (BIOS)
- LPC interface (EC/KBC, Super I/O)
- IRQ controller
- Serial Interrupt Function
- Suspend/Resume control
- Built –in RTC
- GPIO
- 609-ball, 31×31mm, micro BGA Package

PC Card Controller (Texas Instruments-made PCI7411ZHK)

- PCI interface
- CardBus/Ultra Media controller
- SD card controller
- IEEE1394 controller
- 288-ball (16x16x1.4) BGA package



GPU controller (Internal graphic controller)

- VRAM 64/128MB
- PCI Express interface
- LCD I/F LVDS 2ch
- S-video support

 Batteries

The main battery is a detachable lithium-ion main battery (10.8V, 4700mAh, 6 cell) and the RTC battery is a lithium ion battery (2.4V-16mAh).

 Modem controller

Supported by MDC. Using of the secondary AC97 Line

 LAN controller (Marvell made)

Controls LAN and supports 10/100Mbit or Gigabit Ethernet.

 Other main system chips

- EC/KBC (Mitsubishi-made LPC microcontroller M306KAFCLRP)
- PSC (Toshiba-made TMP87PM48UG)
- Temperature sensor (ADM-made ADM1032ARMZ)
- Acceleration sensor (ST Micro-made LIS3L02AQ)
- Super I/O (SMSC-made LPC47N217-JN)
- SOUND CODEC (ADM-made AD1981B)
- AMP (Matsushita-made MM1667XHFE) + HP AMP (MAX4410)
- CLK Generator (ICS-made ICS950812CGLFT)

## 1.2 2.5-inch Hard Disk Drive

A compact, high-capacity SATA HDD with a height of 9.5mm contains a 2.5-inch magnetic disk and magnetic heads.

Figure 1-4 shows a view of the 2.5-inch HDD and Tables 1-1 list the specifications.

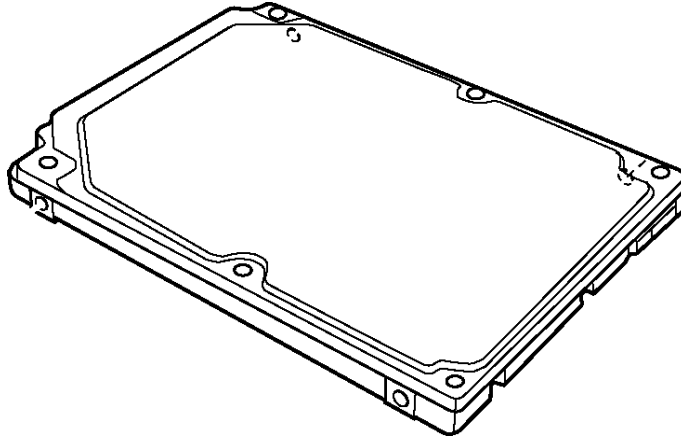


Figure 1-4 2.5-inch HDD

Table 1-1 2.5-inch HDD Specification (1/2)

Items		Specifications		
		FUJITU G8BC0001R410	FUJITU G8BC0001R610	FUJITU G8BC0001R810
Outline dimensions	Width (mm)	70		
	Height (mm)	9.5		
	Depth (mm)	100		
	Weight (g)	99 max.		
Storage size (formatted)		40GB	60GB	80GB
Speed (RPM)		5,400		
Data transfer rate Media Host		53.9MB/s max 1.5Gb/s (Serial-ATA Generation-1)		
Data buffer size (MB)		8		
Average random seek time (ms) Read		12		

Table 1-1 2.5-inch HDD Specifications(2/2)

Items		Specifications
		TOSHIBA HDD2D30BZK01
Outline dimensions	Width (mm)	100
	Height (mm)	9.5
	Depth (mm)	69.85
	Weight (g)	98
Storage size (formatted)		100GB
Speed (RPM)		5400
Data transfer speed (MB/s)		
Internal		236.1-456.0
Host		150
Data buffer size (MB)		8
Access time (ms)		
Average seek time		12
Track to Track		2
Max seek		22

## 1.3 Optical Drive

### 1.3.1 DVD-ROM Drive

The DVD-ROM drive accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) CD/DVD-ROM and CD-R/RW and DVD-RAM (read-only).

The DVD-ROM drive is shown in Figure 1-5. The dimensions and specifications of the DVD-ROM & CD-R/RW drive are described in Table 1-2, Table 1-3.



Figure 1-5 DVD-ROM drive

Table 1-2 DVD-ROM drive outline dimensions

Items		Specifications	
		TSST G8BC0002B410	TEAC G8BC0002E410
Outline dimensions	Width (mm)	128±0.2	128.0
	Height (mm)	12.7±0.2	12.7
	Depth (mm)	126.1	129.4
	Weight (g)	170	180

Table 1-3 DVD-ROM drive specifications (1/2)

Parameter		Drive Specification
		TSST (G8CC0002B410)
Data transfer speed	Read	DVD-ROM(Single-L) MAX 8x(CAV) [MAX 10816KB/s] DVD-ROM(Double-L) MAX 6x(CAV) [MAX 8112KB/s] DVD-R/-RW MAX 4x(CAV) [MAX 5408KB/s] DVD+R/+RW MAX 4x(CAV) [MAX 5408KB/s] DVD-RAM(Ver2.1) MAX 2x(ZCLV) [MAX 2704KB/s] CD(Mode1) MAX 24x(CAV) [MAX 3600KB/s] CD(Mode2) MAX 24x(CAV) [MAX 4104KB/s] CD-DA(Mode1) MAX 10x(CLV) [MAX 1500KB/s] CD-DA(Mode2) MAX 10x(CLV) [MAX 1710KB/s]
	ATAPI interface (MB/s)	PIO mode16.7 MB/s PIO-MODE4 supported DMA mode16.7 MB/s MultiwordDMA-MODE2 supported Ultra DMA mode 33.3 MB/s UltraDMA-MODE2 supported
Access time (ms)	CD-ROM	110 (Random)
	DVD-ROM	110 (Random)
	DVD-RAM	140 (Random)
Buffer memory		256KByte
Supported disk format	CD	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, CD-I, CD-I Bridge(Photo-CD, Video-CD), Multi-session CD(Photo-CD, CD-EXTRA, CD-R, CD-RW, Portfolio),CD-R, CD-RW
	DVD	DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R (Ver1.0, Ver2.1), DVD-RW (Ver1.0, Ver1.1), DVD+R, DVD+RW, DVD-RAM (Version2.1)

Table 1-3 DVD-ROM drive specifications (2/2)

Parameter		Drive Specification
		TEAC (G8CC0002E410)
Data transfer speed	Read	DVD-ROM MAX 8x(CAV) [MAX 4594KB/s] DVD-VIDEO MAX 4x(CAV) [MAX 2297KB/s] DVD-R/RW MAX 8x(CAV) [MAX 4594KB/s] DVD-RAM(4.7GB) MAX 5x(CAV) [MAX 3246KB/s] DVD-RAM(2.6GB) MAX 2.5x(CAV) [MAX 1626KB/s] CD(Mode1) MAX 24x(CAV) [MAX 5137KB/s] CD(Mode2) MAX 20x(CAV) [MAX 4280KB/s] CD-RW MAX 24x(CLV) [MAX 5137KB/s]
	ATAPI interface (MB/s)	PIO mode16.7 MB/s PIO-MODE4 supported DMA mode16.7 MB/s MultiwordDMA-MODE2 supported Ultra DMA mode 33.3 MB/s UltraDMA-MODE2 supported
Access time (ms)	CD-ROM	120 (Random)
	DVD-ROM	130 (Random)
Buffer memory		256K
Supported disk format	CD	CD-DA, CD-ROM MODE1, CD-ROM MODE2, Multi-session CD, Video-CD, Enhanced CD, CD-TEXT, Photo-CD, addressing Method 2
	DVD	DVD-ROM DVD-R (General, Authoring, Single/Multi-boarder), DVD-Video, DVD-RW (Single/Multi-boarder, Packet), DVD-RAM (4.7GB, 2.6GB), DVD+R/RW (Single/Multi-boarder, Packet)

### 1.3.2 DVD-ROM & CD-R/RW Drive

The DVD-ROM & CD-R/RW drive accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) CD/DVD-ROM and CD-R/RW.

The DVD-ROM & CD-R/RW drive is shown in Figure 1-6. The dimensions and specifications of the DVD-ROM & CD-R/RW drive are described in Table 1-4, Table 1-5.



*Figure 1-6 DVD-ROM & CD-R/RW drive*

*Table 1-4 DVD-ROM & CD-R/RW drive outline dimensions*

Parameter		Standard value	
Outline dimensions	Maker (code)	PCC (G8CC0001X411)	TEAC (G8CC0001Y411)
	Width (mm)	128	
	Height (mm)	12.7 (excluding projections)	
	Depth (mm)	129.0	
	Mass (g)	190±10	

Table 1-5 DVD-ROM &amp; CD-R/RW drive specifications (1/2)

Parameter		Drive Specification
		PCC (G8CC0001X411)
Data transfer speed	Read	DVD-ROM MAX 8x(CAV) [MAX 10800 KB/s] CD-ROM MAX 24x(CAV) [MAX 3600 KB/s]
	Write	CD-R 4x/8x(CLV), 16x(PCAV), MAX24x(CAV) CD-RW 4x(CLV) High Speed CD-RW 4x/8x/10x(CLV) Ultra Speed CD-RW 10x(CLV), MAX24x(CAV)
	ATAPI interface (MB/s)	PIO mode16.6 MB/s PIO MODE4 supported DMA mode16.6 MB/s Multiword MODE2 supported Ultra DMA mode 33.3 MB/s Ultra DMA MODE2
Access time (ms)	CD-ROM	150 (Random)
	DVD-ROM	180 (Random)
Buffer memory		2MB
Supported disk format	CD	CD-DA,CD-ROM,CD-ROM XA Photo CD, CD-Extra(CD+), CD-text
	DVD	DVD-R (DVD-R Multi-boarder supported) DVD-RW(Ver.1.1), DVD-Video, DVD+R, DVD+RW, DVD-RAM(2.6GB/4.7GB)



Table 1-5 DVD-ROM &amp; CD-R/RW drive specifications (2/2)

Parameter		Drive Specification
		TEAC (G8CC0001Y411)
Data transfer speed	Read	DVD-ROM MAX 8x(CAV) [MAX 10800 KB/s] CD-ROM MAX 24x(CAV) [MAX 3600 KB/s]
	Write	CD-R 4x/10x(CLV), 16x(CAV), MAX 24x(CAV) CD-RW 4x(CLV) High Speed CD-RW 4x/10x(CLV), 10x(CAV) Ultra Speed CD-RW 10x(CLV), MAX 24x(CAV)
	ATAPI interface (MB/s)	PIO mode 16.6 MB/s PIO MODE4 supported DMA mode 16.6 MB/s Multiword MODE2 supported Ultra DMA mode 33.3 MB/s Ultra DMA MODE2
Access time (ms)	CD-ROM	90 (Random)
	DVD-ROM	110 (Random)
Buffer memory		2MB
Supported disk format	CD	CD-DA, CD-ROM, CD-ROM XA Photo CD, CD-Extra(CD+), CD-text
	DVD	DVD-R (DVD-R Multi-boarder supported) DVD-RW(Ver.1.2), DVD-Video, DVD+R, DVD+RW, DVD-RAM(2.6GB/4.7GB)

### 1.3.3 DVD Super Multi Drive

The DVD Super Multi drive accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) CD/DVD-ROM, CD-R/RW, DVD±R/±RW and DVD-RAM.

The DVD Super Multi drive is shown in Figure 1-7. The dimensions and specifications of the DVD Super Multi drive are described in Table 1-6, Table 1-7.



Figure 1-7 DVD Super Multi drive

Table 1-6 DVD Super Multi drive outline dimensions

Parameter		Standard value	
Outline dimensions	Maker	PCC (G8CC00021410)	PCC (G8CC0002F412)
	Width (mm)	128	128
	Height (mm)	12.7 (excluding projections)	12.7 (excluding projections)
	Depth (mm)	129.0	129.0
	Mass (g)	210±10	190±10

Table 1-7 DVD Super Multi drive specifications (1/2)

Parameter		Drive Specification
		PCC (G8CC00021410)
Data transfer speed	Read(KB/s)	DVD-ROM MAX 8x(CAV) [MAX 10800 KB/s] CD-ROM MAX 24x(CAV) [MAX 3600 KB/s]
	Write	CD-R 4x/8x (CLV), 24x (ZCLV) CD-RW 4x (CLV) High Speed CD-RW 4x/8x/10x (CLV) Ultra Speed CD-RW 10x (CLV) DVD-R 1x/2x (CLV), MAX 8x (CLV) DVD-RW 1x/2x (CLV), MAX 4x (CLV) DVD+R 2.4x (CLV), MAX 8x (CLV) DVD+RW 2.4x (CLV), MAX 4x (CLV) DVD-RAM 3x (ZCLV) (4.7GB/9.4GB)
	ATAPI interface (MB/s)	PIO mode 16.6 MB/s (PIO MODE4 supported) DMA mode 16.6 MB/s (Multi-ward MODE2 supported) Ultra DMA mode 33.3 MB/s(Ultra DMA MODE2 supported)
Access time (ms)	CD-ROM	150 (Random)
	DVD-ROM	180 (Random)
Buffer memory		2MB
Supported disk format	CD	CD-DA, CD-ROM, CD-ROM XA, Photo CD, CD-Extra(CD+), CD-text
	DVD	DVD-R, DVD-RW (Ver1.1), DVD Video, DVD+R, DVD+RW, DVD-RAM (2.6GB/4.7GB)

Table 1-7 DVD Super Multi drive specifications (2/2)

Parameter		Drive Specification
		PCC(G8CC0002F412)
Data transfer speed	Read(KB/s)	DVD-ROM MAX 8x(CAV) [MAX 10800 KB/s] CD-ROM MAX 24x(CAV) [MAX 3600 KB/s]
	Write	CD-R 4x/8x (CLV), 24x (ZCLV) CD-RW 4x (CLV) High Speed CD-RW 4x/8x/10x (CLV) Ultra Speed CD-RW 10x (CLV) DVD-R 1x/2x (CLV), MAX 8x (CLV) DVD-RW 1x/2x (CLV), MAX 4x (ZCLV) DVD+R 2.4x (CLV), MAX 8x (ZCLV) DVD+RW 2.4x (CLV), MAX 4x (ZCLV) DVD-RAM 3x (ZCLV) (4.7GB/9.4GB)
	ATAPI interface (MB/s)	PIO mode 16.6 MB/s (PIO MODE4 supported) DMA mode 16.6 MB/s (Multi-ward MODE2 supported) Ultra DMA mode 33.3 MB/s(Ultra DMA MODE2 supported)
Access time (ms)	CD-ROM	150 (Random) (typ.)
	DVD-ROM	180 (Random) (typ.)
Buffer memory		2MB
Supported disk format	CD	CD-DA, CD-ROM, CD-ROM XA, Photo CD, CD-Extra(CD+), CD-text
	DVD	DVD-R, DVD-RW (Ver1.1), DVD Video, DVD+R, DVD+RW, DVD-RAM (2.6GB/4.7GB)

### 1.3.4 DVD Super Multi Drive (Double-layer)

The DVD Super Multi drive (Double-layer) accommodates either 12 cm (4.72-inch) or 8 cm (3.15-inch) CD/DVD-ROM, CD-R/RW, DVD±R/±RW, DVD-RAM and DVD+R (Double-layer).

The DVD Super Multi drive (Double-layer) is shown in Figure 1-8. The dimensions and specifications of the DVD Super Multi drive (Double-layer) are described in Table 1-8, Table 1-9.



Figure 1-8 DVD Super Multi drive (Double-layer)

Table 1-8 DVD Super Multi drive (Double-layer) outline dimensions

Parameter		Standard value		
Outline dimensions	Maker	PCC (G8CC00021411)	PCC (G8CC0002F411)	TEAC (G8C0002G421)
	Width (mm)	128	128	128
	Height (mm)	12.7 (excluding projections)	12.7 (excluding projections)	12.7 (excluding projections)
	Depth (mm)	129.0	129.0	129.4(excluding the eject button)
	Mass (g)	210±10	190±10	220 or less

Table 1-9 DVD Super Multi drive (Double-layer) specifications (1/3)

Parameter		Drive Specification
		PCC (G8CC00021411)
Data transfer speed	Read(KB/s)	DVD-ROM MAX 8x(CAV) [MAX 10800 KB/s] CD-ROM MAX 24x(CAV) [MAX 3600 KB/s]
	Write	CD-R 4x/8x(CLV), 24x (ZCLV) CD-RW 4x(CLV) High Speed CD-RW 4x/8x/10x(CLV) Ultra Speed CD-RW 10x(CLV) DVD-R 1x/2x(CLV), MAX 8x(ZCLV) DVD-RW 1x/2x(CLV), MAX 4x(ZCLV) DVD+R 2.4x(CLV), MAX 8x(ZCLV) DVD+R Double Layer 2.4x(CLV) DVD+RW 2.4x(CLV), MAX 4x(ZCLV) DVD-RAM 3x(ZCLV) (4.7GB/9.4GB)
	ATAPI interface (MB/s)	PIO mode 16.6 MB/s (PIO MODE4 supported) DMA mode 16.6 MB/s (Multi-ward MODE2 supported) Ultra DMA mode 33.3 MB/s(Ultra DMA MODE2 supported)
Access time (ms)	CD-ROM	150 (Random)
	DVD-ROM	180 (Random)
Buffer memory		2MB
Supported disk format	CD	CD-DA, CD-ROM, CD-ROM XA, Photo CD, CD-Extra(CD+), CD-text
	DVD	DVD-R, DVD-RW (Ver1.1), DVD Video, DVD+R, DVD+RW, DVD-RAM (2.6GB/4.7GB) DVD+R DL

Table 1-9 DVD Super Multi drive (Double-layer) specifications (2/3)

Parameter		Drive Specification
		PCC(G8CC0002F411)
Data transfer speed	Read(KB/s)	DVD-ROM MAX 8x(CAV) [MAX 10800 KB/s] CD-ROM MAX 24x(CAV) [MAX 3600 KB/s]
	Write	CD-R 4x/8x (CLV), 24x (ZCLV) CD-RW 4x (CLV) High Speed CD-RW 4x/8x/10x (CLV) Ultra Speed CD-RW 8x/10x (CLV) DVD-R 1x/2x (CLV), MAX 8x (ZCLV) DVD-RW 1x/2x (CLV), MAX 4x (ZCLV) DVD+R 2.4x(CLAV), MAX 8x(ZCLV) DVD+R Double Layer 2.4x(CLAV) DVD+RW 2.4x (CLV), MAX 4x (ZCLV) DVD-RAM 2x/3x (ZCLV) (4.7GB/9.4GB)
	ATAPI interface (MB/s)	PIO mode 16.6 MB/s (PIO MODE4 supported) DMA mode 16.6 MB/s (Multi-ward MODE2 supported) Ultra DMA mode 33.3 MB/s(Ultra DMA MODE2 supported)
Access time (ms)	CD-ROM	150 (Random) (typ.)
	DVD-ROM	180 (Random) (typ.)
Buffer memory		2MB
Supported disk format	CD	CD-DA, CD-ROM, CD-ROM XA, Photo CD, CD-Extra(CD+), CD-text
	DVD	DVD-R(3.9GB), DVD-RW (Ver1.1,Ver1.2), DVD Video, DVD+R, DVD+RW, DVD-RAM (2.6GB/4.7GB) DVD+R DL

Table 1-9 DVD Super Multi drive (Double-layer) specifications (3/3)

Parameter		Drive Specification
		TEAC(G8C0002G421)
Data transfer speed	Read(KB/s)	DVD-ROM MAX 8x(CAV) CD-ROM MAX 24x(CAV)
	Write	CD-R 4x/10x(CLV), 10-24x (ZCLV) CD-RW 10x (CLV), 4x(CLV) DVD-R 2-8x (ZCLV), 1/2x(CLV) DVD-RW 2 4x(CLV), 1/2x (CLV) DVD+R 2.4-8x(CLV), 2.4x (CLV) DVD+R Double Layer 2.4x(CLV) DVD+RW 2.4-4x(ZCLV), 2.4x (CLV)
	ATAPI interface (MB/s)	PIO mode 16.6 MB/s (PIO MODE4 supported) DMA mode 16.6 MB/s (Multi-ward MODE2 supported) Ultra DMA mode 33.3 MB/s(Ultra DMA MODE2 supported)
Access time (ms)	CD-ROM	130 (average)
	DVD-ROM	130 (average)
Buffer memory		8MB
Supported disk format	CD	CD-DA, CD-ROM, CD-ROM XA, Photo CD, Enhanced CD, CD-text
	DVD	DVD-ROM, DVD-R(General, Authoring), DVD-RW, DVD Video, DVD+R, DVD+RW, DVD-RAM (2.6GB/4.7GB) DVD+R L



## **1.4 Keyboard**

The keyboard is mounted 85(US)/86(UK) keys that consist of character key and control key, and in conformity with ASCII. The keyboard is connected to membrane connector on the system board and controlled by the keyboard controller.

Figure1-9 is a view of the keyboard.

See Appendix E about a layout of the keyboard.



*Figure 1-9 Keyboard*

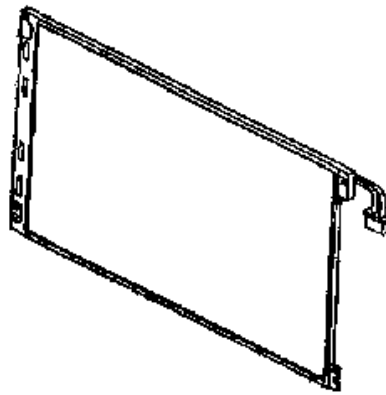
## 1.5 TFT Color Display

The TFT color display consists of a LCD module and FL inverter board.

### 1.5.1 LCD Module

The LCD module used for the TFT color display uses a backlight as the light source and can display images and characters of 16M colors with 1,400x1,050 resolution.

Figure 1-10 shows a view of the LCD module and Table 1-10 lists the specifications.



*Figure 1-10 LCD module*

*Table 1-10 LCD module specifications (14.1 TFT)*

Item	Specifications
	<b>G33C0002P110</b>
Number of Dots	1,400 (W) x 1,050 (H)
Dot spacing (mm)	0.204 (H) x 0.204 (V)
Display range (mm)	285.6 (H) x 214.2 (V)
Outline dimensions	299 (w) x 229 (H) x 7.7 (D)

### 1.5.2 FL Inverter Board

The FL inverter board supplies a high frequency current to illuminate the LCD module FL.

Table 1-11 lists the FL inverter board specifications.

*Table 1-11 FL inverter board specifications*

Item		Specifications
		<b>G71C00011110</b>
Input	Voltage (V)	5 (DC)
	Power (W)	7
Output	Voltage (V)	750 (r.m.s)
	Power	5.0W / 7VA
	Current (mA) (f=70KHz)	6.00 (r.m.s)

## **1.6 Power Supply**

The power supply supplies different voltages to the system board.

The power supply microcontroller has the following functions.

1. Judges that the DC power supply (AC adapter) is connected to the computer.
2. Detects DC output and circuit malfunctions.
3. Controls the battery icon, and DC IN icon.
4. Turns the battery charging system on and off and detects a fully charged battery.
5. Turns the power supply on and off.
6. Provides more accurate detection of a low battery.
7. Calculates the remaining battery capacity.
8. Controls the transmission of the status signal of the main battery.

Table 1-12 lists the power supply output specifications.

Table 1-12 Power supply output specifications (1/2)

Name	Power supply (Yes/No)				
	Voltage [V]	Power OFF (Suspend mode)	Power OFF (Boot mode)	No battery	Object
PPV	1.308 - 0.748	No	No	No	CPU
PTV	1.05	No	No	No	CPU, MCH, ICH6-M
1R5-P1V	1.5	No	No	No	CPU, MCH, ICH6-M
1R8-B1V	1.8	Yes	No	No	MCH, DDR2-SDRAM
2R5-P2V	2.5	No	No	No	MCH, ICH6-M
MR0R9-BOV	0.9	Yes	No	No	MCH, DDR2-SDRAM
0R9-P0V	0.9	No	No	No	DDR2-SDRAM
1CH1R5-S1V	1.5	Yes	Yes	No	ICH6-M
ICH-S3V	3.3	Yes	Yes	No	ICH6-M
ICH-S5V	5	Yes	Yes	No	ICH6-M
1R2-P1V	1.2	No	No	No	GPU
1R9-P1V	1.9	No	No	No	GPU
PGV	1.2	No	No	No	GPU
P3V	3.3	No	No	No	Clock Generator, Thermal Sensor, GMCH, SDRAM(SPD), ICH6-M, PCI7411, Mini-PCI, TPM, FWH, AD1981B, Super I/O, FIR, GPU, LCD, Accelerometer
E3V	3.3	Yes	Yes/No	No	PCI17411, PC card power, IEEE1394, Mini-PCI, MDC
LAN-E3V	3.3	Yes	Yes/No	No	LAN power
LAN2R5-E2V	2.5	Yes	Yes/No	No	LAN power
LAN1R2-E1V	1.2	Yes	Yes/No	No	LAN power
S3V	3.3	Yes	Yes	No	ICH6-M, EC/KBC, Accelerometer
P5V	5	No	No	No	CRT, ICH6-M, SeleBay power, FL inverter, HDD, KB, PAD, Parallel, Mini PCI, Bluetooth power, Dock power

Table 1-12 Power supply output specifications (2/2)

Name	Power supply (Yes/No)				Object
	Voltage[V]	Power OFF (Suspend mode)	Power OFF (Boot mode)	No battery	
SND-P5V	5	No	No	No	Amp
A4R7-P4V	4.7	No	No	No	AD1981B, Amp, Microphone Amp, Line In, Line out
E5V	5	Yes	No	No	PC Card power, USB power
M5V	5	Yes	Yes	No	Temperature reset IC, LEDs, Dock (PnP ID EEPROM)
MCV	5	Yes	Yes	No	PSC
R3V	2.0 -3.6	Yes	Yes	Yes	ICH6-M(RTC)

## 1.7 Batteries

The PC has the following two batteries.

- Main battery
- Real time clock (RTC) battery

Table 1-13 lists the specifications for these two batteries.

*Table 1-13 Battery specifications*

Battery Name		Battery Element	Output Voltage	Capacity
Main battery	G71C0004S110	Lithium ion (6 cell)	10.8 V	4,700 mAh
	G71C0004S210			
Real time clock (RTC) battery	P71035009115	Nickel hydrogen	2.4V	16mAh

### 1.7.1 Main Battery

The main battery is the primary power supply for the computer when the AC adapter is not connected. In standby (instant recovery) mode, the main battery maintains the current status of the computer.

## 1.7.2 Battery Charging Control

Battery charging is controlled by a power supply microprocessor. The power supply microprocessor controls power supply and detects a full charge when the AC adapter and battery are connected to the computer.

### ❑ Quick Battery Charge

When the AC adapter is connected, normal charging is used while the system is turned on and quick charge is used while the system is turned off or in standby mode. Table 1-14 lists the main battery charging time.

*Table 1-14 Time required for charges of main battery*

Battery Capacity	Charging Time	
	Normal charge	Quick charge
Main (4700mAh)	about 5.5 to 13.0	about 3.0
Second (3600mAh)	about 4.0 to 9.5	about 3.0

Quick battery charge is stopped in the following cases.

1. The main battery is fully charged
2. The main battery is removed
3. Main battery or AC adapter voltage is abnormal
4. Charging current is abnormal

Data preservation time

When turning off the power in being charged fully, the preservation time is as following Table 1-15.

*Table 1-15 Data preservation time*

Condition		preservation time
Main (4700mAh)	Standby mode	About 5 days
	Boot mode	About 40 days
Second (3600mAh)	Standby mode	About 4 days
	Boot mode	About 30 days



### 1.7.3 RTC Battery

The RTC battery provides the power supply to maintain the date, time, and other system information in memory. Table 1-16 lists the battery charging time and data preservation times.

*Table 1-16 RTC battery charging/data preservation time*

		Time
Charging time	AC adapter or main battery in use (Power ON)	about 8 hours
Data preservation time (when fully charged)		about 30 days

## 1.8 AC Adapter

The AC adapter is also used to charge the battery.

Table 1-17 lists the AC adapter specifications.

*Table 1-17 AC adapter specifications*

Parameter	Specification	
	G71C00043210	G71C00049210
Input rated voltage	100V/240V	
Input frequency range	47Hz to 63Hz	
Input current	1.5A or less (100VAC 5A load) 1.25A or less (240VAC 5A load)	
Output rated voltage	DC 15V	
Output current	0A to 5.0A (Constant voltage mode)s	



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# **Chapter 2**

# **Troubleshooting**

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## 2.1 Troubleshooting

Chapter 2 describes how to determine which Field Replaceable Unit (FRU) in the computer is causing the computer to malfunction. (The “FRU” means the replaceable unit in the field.)

The FRUs covered are:

- |                  |                  |
|------------------|------------------|
| 1. Power supply  | 9. Modem         |
| 2. System board  | 10. Bluetooth    |
| 3. 3.5” USB FDD  | 11. LAN          |
| 4. 2.5” HDD      | 12. Sound        |
| 5. Keyboard      | 13. SD card slot |
| 6. Display       | 14. Tablet pen   |
| 7. Touch pad     | 15. Wireless LAN |
| 8. Optical drive |                  |

The Detailed replacement procedures are given in Chapter 4. Test Program operations are described in Chapter 3.

**NOTE:** After replacing the System board or CPU, it is necessary to execute the subtest 01 Initial configuration of 3.3 Setting of the hardware configuration in Chapter 3.

The following tools are necessary in addition to tools described in Chapter 3 for implementing the Diagnostics procedures:

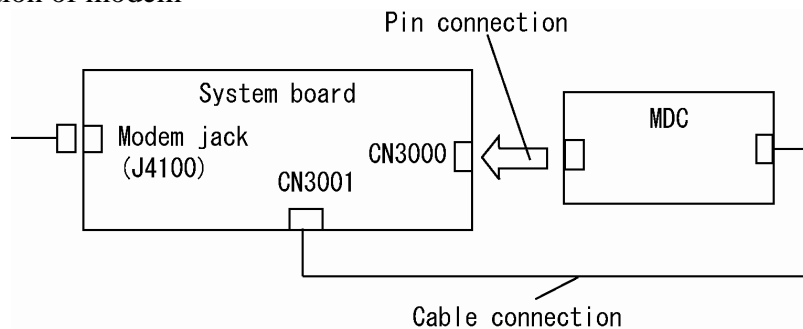
1. Phillips screwdrivers
2. Toshiba MS-DOS system FD
3. Debug test cable (for debug port test)
4. RS-232C cross-cable (for debug port test)
5. Test board (for debug port test)
6. External monitor (for display check)

There are following two types of connections in the figures of board and module connection in and after 2.3 Power Supply Troubleshooting.

(1) Cable connection is described as a line in the figures.

(2) Pin connection is described as an arrow in the figure.

<e.g> Connection of modem



## 2.2 Troubleshooting Flowchart

Use the flowchart in Figure 2-1 as a guide for determining which FRU malfunctions. Before going through the flowchart steps, check the following:

- Make sure that Toshiba Windows® XP Tablet PC Edition is installed on the hard disk. Other operating systems can cause the computer malfunction.
- Make sure all optional equipment is removed from the computer.

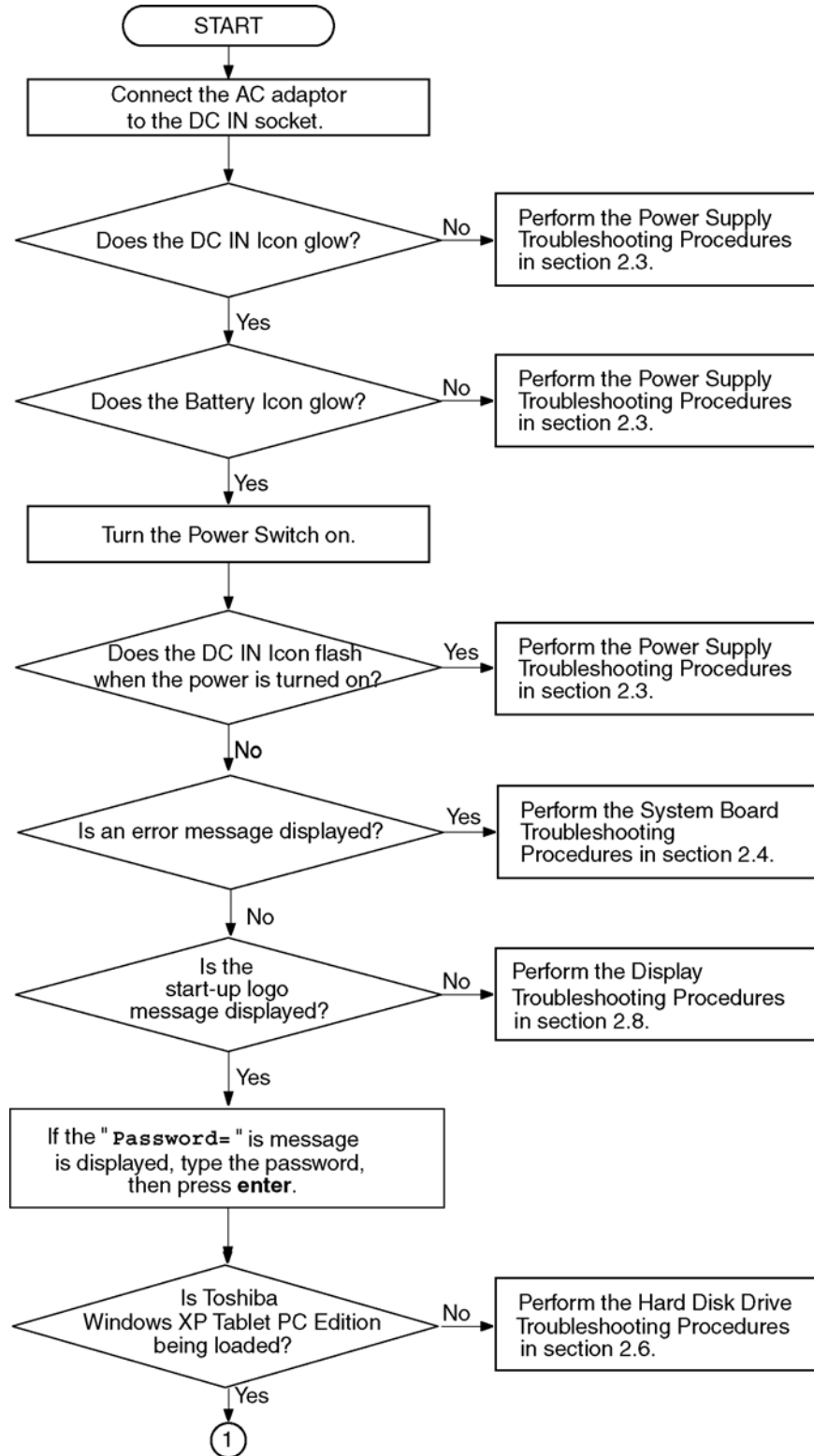


Figure 2-1 Troubleshooting flowchart (1/2)

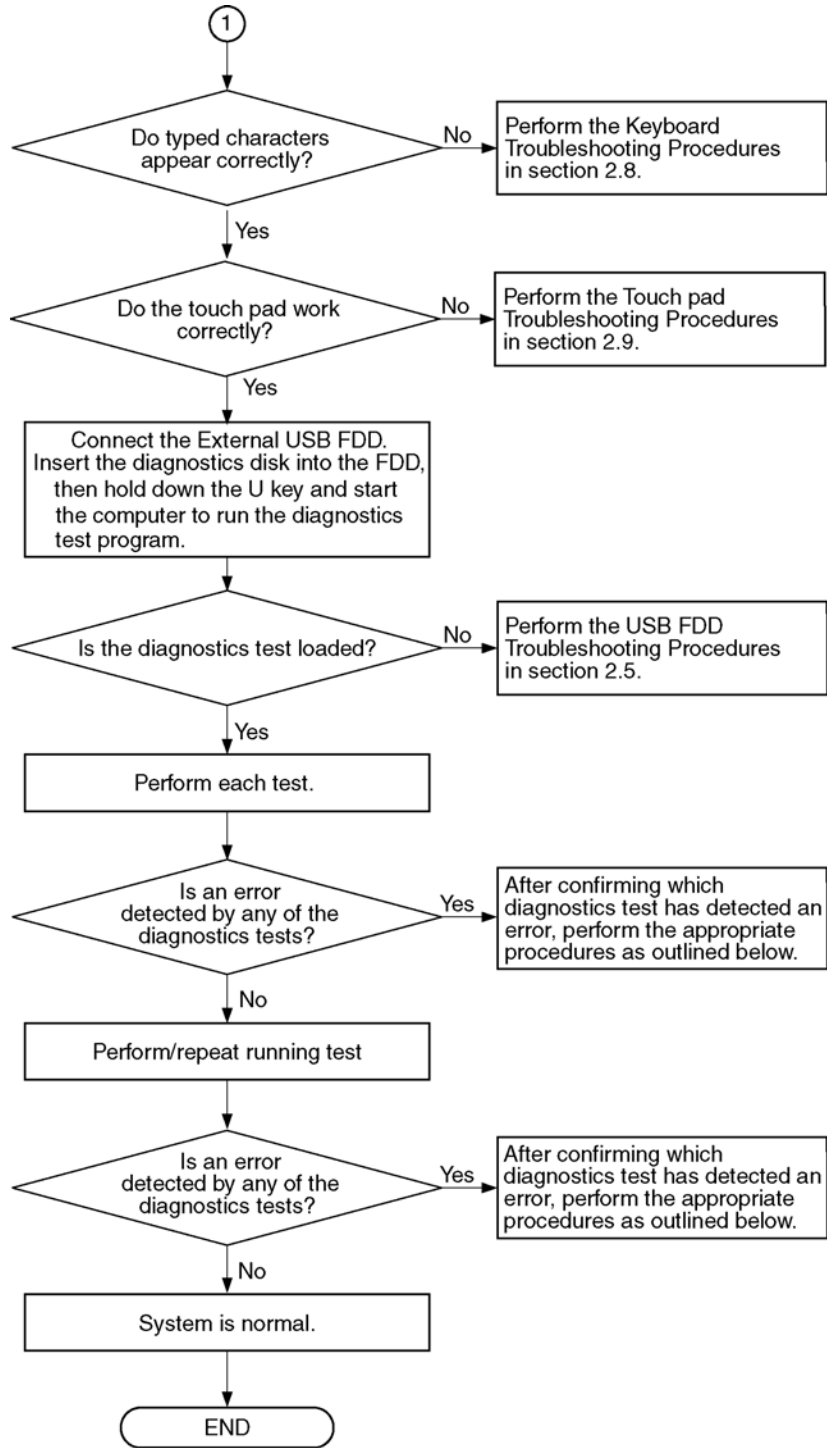


Figure 2-1 Troubleshooting flowchart (2/2)

If the diagnostics program cannot detect an error, the problem may occur intermittently. The Test program should be executed several times to isolate the problem. Check the Log Utilities function to confirm which diagnostic test detected an error(s), and perform the appropriate troubleshooting procedures as follows:

1. If an error is detected on the System test, Memory test, ASYNC test, Real timer test, NDP test or expansion test, perform the System board Troubleshooting Procedures in Section 2.4.
2. If an error is detected on the Keyboard, perform the Keyboard Troubleshooting Procedures in Section 2.7.
3. If any trouble is detected on the Display, perform the Display Troubleshooting Procedures in Section 2.8.
4. If any trouble is detected on the Floppy disk, perform the USB FDD Troubleshooting Procedures in Section 2.5.
5. If any trouble is detected on the Hard disk, perform the HDD Troubleshooting Procedures in Section 2.6.
6. If any trouble is detected on the Touch pad, perform the Touch Pad Troubleshooting Procedures in Section 2.9.
7. If any trouble is detected on the Selectable bay, perform the Selectable bay Troubleshooting Procedures in Section 2.10.
8. If any trouble is detected on the modem test, perform the Modem Troubleshooting Procedures in Section 2.11.
9. If any trouble is detected on the Bluetooth, perform the Bluetooth Troubleshooting Procedures in Section 2.12.
10. If any trouble is detected on the LAN, perform the LAN Troubleshooting Procedures in Section 2.13.
11. If any trouble is detected on the sound test, perform the Sound Troubleshooting Procedures in Section 2.14.
12. If any trouble is detected on the SD card slot, perform the SD Card Slot Troubleshooting Procedures in Section 2.15.
13. If any trouble is detected on the Tablet pen, perform the Tablet Pen Troubleshooting Procedures in Section 2.16.
14. If any trouble is detected on the Wireless LAN, perform the Wireless LAN Troubleshooting Procedures in Section 2.17.

## 2.3 Power Supply Troubleshooting

The power supply controller controls many functions and components. To determine if the power supply is functioning properly, start with Procedure 1 and continue with the other Procedures as instructed. The procedures described in this section are:

Procedure 1: Power Supply Icon Check

Procedure 2: Error Code Check

Procedure 3: Connection Check

Procedure 4: Quick Charge Check

Procedure 5: Replacement Check

### Procedure 1 Power Supply Icon Check

The following two icons indicate the power supply status:

- Battery icon
- DC IN icon

The power supply controller uses the power supply status with the Battery icon and the DC IN icon as listed in the tables below.

*Table 2-1 Battery icon*

Battery icon	Power supply status
Lights orange	Battery is charged and the external DC is input. It has no relation with ON/OFF of the system power.
Lights green	Battery is fully charged and the external DC is input. It has no relation with ON/OFF of the system power.
Blinks orange (even intervals)	The battery level is low while the system power is ON.
Flashes orange (at being switched on)	The battery level is low and the power is turned on only with the battery.
Doesn't light	Any condition other than those above.

*Table 2-2 DC IN icon*

DC IN icon	Power supply status
Lights green	DC power is being supplied from the AC adapter.
Blinks orange	Power supply malfunction <sup>*1</sup>
Doesn't light	Any condition other than those above.

\*1 When the power supply controller detects a malfunction, the DC IN icon blinks orange. It shows an error code.



When icons are blinking, perform the following procedure.

1. Remove the battery pack and the AC adapter and cut off the power supply to the computer by force.
2. Re-attach the battery pack and the AC adapter.

If icons are still blinking after the operation above, check the followings:

Check 1 If the DC IN icon blinks orange, go to Procedure 2.

Check 2 If the DC IN icon does not light, go to Procedure 3.

Check 3 If the battery icon does not light orange or green, go to Procedure 4.

**CAUTION:** Use a recommended AC adapter (G71C00043210 or G71C00049210).

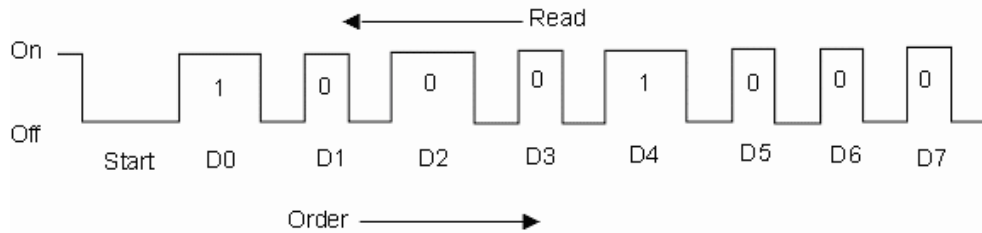
**Procedure 2 Error Code Check**

If the power supply microprocessor detects a malfunction, the DC IN icon blinks orange. The blink pattern indicates an error as shown below.

- Start Off for 2 seconds
- Error code (8 bit)
  - “1” On for one second
  - “0” On for half second
- Interval between data bits On for half second

The error code begins with LSB (Least Significant bit)

Example: Error code 11h (Error codes are given in hexadecimal format.)



Check 1 Convert the DC IN icon blink pattern into the hexadecimal error code and compare it to the tables below. Then go to Check 2.

- Error code

Error code	Power supply of error detected
1*h	DC Power (AC Adapter)
2*h	1 <sup>st</sup> battery
3*h	2 <sup>nd</sup> battery
4*h	S3V output (P60V)
5*h	1R5-C1V output (P61)
6*h	1R5-C1V output (P62)
7*h	PPV output (P63)
8*h	PGV output (P64)
9*h	PTV output (P65)
A*h	1R9-B1V output (P66)
B*h	PGV output (P63)
C*h	E3V output (P64)
D*h	PTV output (P65)
E*h	1R9-B1V output (P66)

DC power supply (AC adapter)

Error code	Meaning
10h	AC Adapter output voltage is over 16.5V.
11h	Dock output voltage is over 16.5V.
12h	Current from the DC power supply is over 7.0A.
13h	Current from the DC power supply is over 0.5A when there is no load.
14h	Abnormal current has been sensed 0[A].

First Battery

Error code	Meaning
20h	Overvoltage is detected. (This is not supported.)
21h	Main battery charge current is over 7.00A.
22h	Main battery discharge current is over 3.9A when there is no load.
23h	Main battery charge current is over 3.9A when AC adapter is not connected.
24h	Abnormal current has been sensed 0[A].
25h	Main battery charge current is over 0.3A.

Second Battery

Error code	Meaning
30h	Overvoltage is detected. (This is not supported.)
31h	Second battery charge current is over 7.00A.
32h	Second battery discharge current is over 3.9A when there is no load.
33h	Second battery charge current is over 3.9A when AC adapter is not connected.
34h	Abnormal current has been sensed 0[A].
35h	Second battery charge current is over 0.3A.

❑ S3V output (P60)

Error code	Meaning
40h	S3V voltage is 2.81V or less when the computer is powered on/off.
45h	S3V voltage is 2.81V or less when the computer is booting up. (CV support)

❑ 1R5-C1V output (P61)

Error code	Meaning
50h	1R5-C1V voltage is over 1.80V when the computer is powered on/off.
51h	1R5-C1V voltage is 1.275V or less when the computer is powered on.
52h	1R5-C1V voltage is 1.275V or less when the computer is booting up.
53h	1R5-C1V voltage is 1.275V or less when the computer is suspended.
54h	1R5-C1V voltage is abnormal during shutdown (CV support)
55h	1R5-C1V voltage is 1.275V or less when the computer is booting up. (CV support)

❑ 1 R5-C1V output (P62)

Error code	Meaning
60h	1R5-C1V voltage is over 2.16V when the computer is powered on/off.
61h	1R5-C1V voltage is 1.275V or less when the computer is powered on.
62h	1R5-C1V voltage is 1.275V or less when the computer is booting up.
63h	1R5-C1V voltage is 1.275V or less when the computer is suspended.
64h	1R5-C1V voltage is abnormal during shutdown (CV support)
65h	1R5-C1V voltage is 1.275V or less when the computer is booting up. (CV support)

❑ PPV output (P63 : MUX\_CH0)

Error code	Meaning
70h	PPV voltage is over 1.80V when the computer is powered on/off.
71h	PPV voltage is 0.56V or less when the computer is powered on.
72h	PPV voltage is 0.56V or less when the computer is booting up.
73h	PPV voltage is 0.56V or more when the computer is powered off.

❑ PGV output (P64)

Error code	Meaning
80h	PGV voltage is over 6.00V when the computer is powered on/off.
81h	PGV voltage is 4.5V or less when the computer is powered on.
82h	PGV voltage is 4.5V or less when the computer is booting up.
83h	PGV voltage is 4.5V or more when the computer is powered off.
84h	PGV voltage is 4.5V or less when the computer is suspended.

❑ PTV output (P65)

Error code	Meaning
90h	PTV voltage is over 1.26V when the computer is powered on/off.
91h	PTV voltage is 0.89V or less when the computer is powered on.
92h	PTV voltage is 0.89V or less when the computer is booting up.
93h	PTV voltage is 0.89V or more when the computer is powered off.
94h	PTV voltage is 0.89V or less while the computer is suspended.

❑ 1R9-B1V output (P66)

Error code	Meaning
A0h	1R9-B1V voltage is over 2.4V when the computer is powered on/off.
A1h	1R9-B1V voltage is 1.53V or less when the computer is powered on.
A2h	1R9-B1V voltage is 1.53V or less when the computer is booting up.
A3h	1R9-B1V voltage is 1.53V or more when the computer is powered off.
A4h	1R9-B1V voltage is 1.53V or less while the computer is suspended.

❑ PGV output (P63 : MUX\_CH1)

Error code	Meaning
B0h	PGV voltage is over 1.62V when the computer is powered on.
B1h	PGV voltage is 0.68V or less when the computer is powered on.
B2h	PGV voltage is 0.68V or less when the computer is booting up.
B3h	PGV voltage is 0.68V or more when the computer is powered off.

❑ E3V output (P64)

Error code	Meaning
C0h	E3V voltage is over 3.96V when the computer is powered on.
C1h	E3V voltage is 2.81V or less when the computer is powered on.
C2h	E3V voltage is 2.81V or less when the computer is booting up.
C3h	E3V voltage is 2.81V or more when the computer is powered off.
C4h	E3V voltage is 2.81V or less while the computer is suspended.

❑ PTV output (P65 : MUX\_CH1)

Error code	Meaning
D0h	PTV voltage is over 1.26V when the computer is powered on.
D1h	PTV voltage is 0.89V or less when the computer is powered on.
D2h	PTV voltage is 0.89V or less when the computer is booting up.
D3h	PTV voltage is 0.89V or more when the computer is powered off.
D4h	PTV voltage is 0.89V or less while the computer is suspended.

❑ 1R9-B1V output (P66 : MUX\_CH1)

Error code	Meaning
E0h	1R9-B1V voltage is over 2.4V when the computer is powered on.
E1h	1R9-B1V voltage is 1.53V or less when the computer is powered on.
E2h	1R9-B1V voltage is 1.53V or less when the computer is booting up.
E3h	1R9-B1V voltage is 1.53V or more when the computer is powered off.
E4h	1R9-B1V voltage is 1.53V or less while the computer is suspended.

Check 2 In the case of error code 10h or 12h:

- Make sure the AC adapter and AC power cord are firmly plugged into the DC IN 15 V socket and wall outlet. If the cables are connected correctly, go to the following step:
- Connect a new AC adapter and AC power cord. If the error still exists, go to Procedure 5.

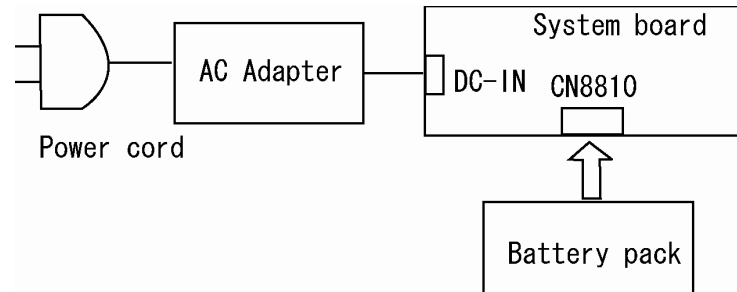
Check 3 In the case of error [code 21h](#):

- Go to Procedure 3.

Check 4 For any other errors, go to Procedure 5.

### Procedure 3 Connection Check

The wiring diagram related to the power supply is shown below:



Any of the connectors may be disconnected. Perform starting from Check 1.

- Check 1 Make sure the AC adapter and the AC power cord are firmly plugged into the DC IN 15 V socket and wall outlet. If these cables are connected correctly, go to Check 2.
- Check 2 Replace the AC adapter and the AC power cord with new ones.
- If the DC IN icon does not light, go to Procedure 5.
  - If the battery icon does not light, go to Check 3.
- Check 3 Make sure the battery pack is installed in the computer correctly. If the battery is properly installed and the battery icon still does not light, go to Procedure 4.

### Procedure 4 Quick Charge Check

Check if the power supply controller charges the battery pack properly. Perform the following procedures:

- Check 1 Make sure the AC adapter is firmly plugged into the DC IN socket.
- Check 2 Make sure the battery pack is properly installed to the PC. If the battery is properly installed, go to Check 3.
- Check 3 The battery pack may be completely discharged. Wait a few minutes to charge the battery pack while connecting the battery pack and the AC adapter to the PC. If the battery pack is still not charged, go to Check 4.
- Check 4 The battery's temperature is too high or low. Return the temperature to normal operating condition. If the battery pack is still not charged, go to Check 5.
- Check 5 Replace the battery pack with a new one. If the battery pack is still not charged, go to Procedure 5.



**Procedure 5 Replacement Check**

The power is supplied to the System board by the AC adapter. If either the AC adapter or the System board was damaged, perform the following Checks.

To disassemble the computer, follow the steps described in Chapter 4.

Check 1 Replace the AC adapter with a new one. If power is not supplied properly to the PC, perform Check 2.

Check 2 Replace the System board with a new one.

## **2.4 System board Troubleshooting**

This section describes how to determine if the System board is defective. Start with Procedure 1 and continue with the other procedures as instructed. The procedures described in this section are:

Procedure 1: Message Check

Procedure 2: Debug port (D port) Check on Boot Mode

Procedure 3: Diagnostic Test Program Execution Check

Procedure 4: Replacement Check

### Procedure 1 Message Check

When the power is turned on, the system performs the Initial Reliability Test (IRT) installed in the BIOS ROM. The IRT tests each IC on the System board and initializes it.

- If an error message is shown on the display, perform Check 1.
- If there is no error message, go to Procedure 2.
- If MS-DOS or Windows XP Tablet PC Edition is properly loaded, go to Procedure 4.

Check 1 If one of the following error messages is displayed on the screen, press the **F1** key as the message instructs. These errors occur when the system configuration preserved in the RTC memory (CMOS type memory) is not the same as the actual configuration or when the data is lost.

If you press the **F1** key as the message instructs, the **SETUP** screen appears to set the system configuration. If any other error message is displayed, perform Check 2.

- (a)\*\*\* Bad HDD type \*\*\*  
Check system. Then press [F1] key .....
- (b)\*\*\* Bad configuration \*\*\*  
Check system. Then press [F1] key .....
- (c)\*\*\* Bad memory size \*\*\*  
Check system. Then press [F1] key .....
- (d)\*\*\* Bad time function \*\*\*  
Check system. Then press [F1] key .....
- (e)\*\*\* Bad check sum (CMOS) \*\*\*  
Check system. Then press [F1] key .....
- (f)\*\*\* Bad check sum (ROM) \*\*\*  
Check system. Then press [F1] key .....
- (g)RTC battery is low or CMOS checksum is inconsistent  
Press [F1] key to set Date/Time

Check 2 If the following error message is displayed on the screen press any key as the message instructs.  
The following error message appears when data stored in RAM under the resume function is lost because the battery has become discharged or the System board is damaged. Go to Procedure 3.

```
WARNING: RESUME FAILURE.  
PRESS ANY KEY TO CONTINUE.
```

If any other error message is displayed, perform Check 3.

**Check 3** The IRT checks the System board. When the IRT detects an error, the system stops or an error message appears.

If one of the following error messages (1) through (17), (22) or (23) is displayed, go to Procedure 5.

If error message (18) is displayed, go to the Keyboard Troubleshooting Procedures in Section 2.7.

If error message (19), (20) or (21) is displayed, go to the 2.5" HDD Troubleshooting Procedures in Section 2.6.

- (1) PIT ERROR
- (2) MEMORY REFRESH ERROR
- (3) TIMER CH.2 OUT ERROR
- (4) CMOS CHECKSUM ERROR
- (5) CMOS BAD BATTERY ERROR
- (6) FIRST 64KB MEMORY ERROR
- (7) FIRST 64KB MEMORY PARITY ERROR
- (8) VRAM ERROR
- (9) SYSTEM MEMORY ERROR
- (10) SYSTEM MEMORY PARITY ERROR
- (11) EXTENDED MEMORY ERROR
- (12) EXTENDED MEMORY PARITY ERROR
- (13) DMA PAGE REGISTER ERROR
- (14) DMAC #1 ERROR
- (15) DMAC #2 ERROR
- (16) PIC #1 ERROR
- (17) PIC #2 ERROR
- (18) KBC ERROR
- (19) HDC ERROR
- (20) HDD #0 ERROR
- (21) HDD #1 ERROR
- (22) TIMER INTERRUPT ERROR
- (23) RTC UPDATE ERROR

**Procedure 2 Debug Port (D port) Check on Boot Mode**

Check the D port status by a debug port test. The tool for debug port test is shown below.

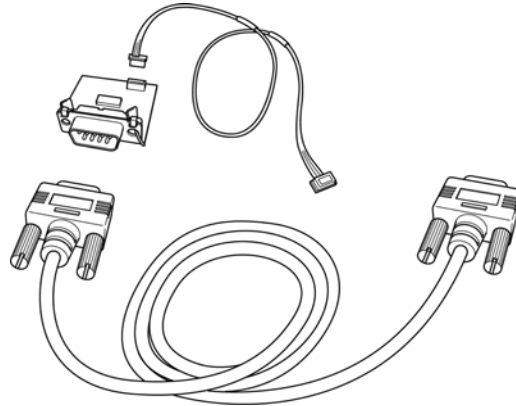
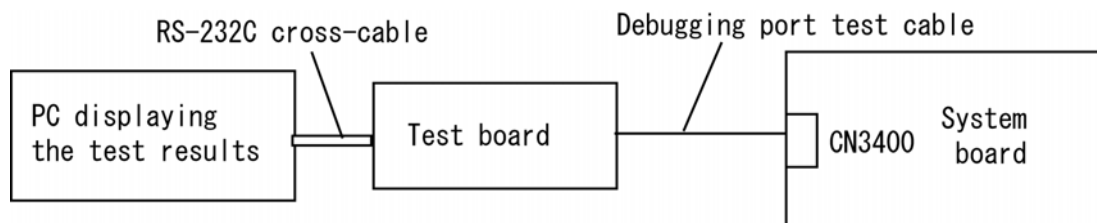


Figure 2-2 A set of tool for debug port test

The test procedures are follows;

1. Connect the debug test cable to the connector CN3400 of the System board. For disassembling the PC to connect the test cable, refer to Chapter 4.
2. Connect the debug port test cable and RS-232C cross-cable to the test board.
3. Connect the RS-232C cross-cable to the PC that displays the results.



4. Boot the computer in MS-DOS mode.

- Execute GETDPORT.COM in the text menu in CPU REAL mode. (Insert the FD for starting D port into FDD and input "FD starting drive:>dport".)  
The D port status is displayed in the following form;

F100 : 000.000382	IRT_CHK_INI\SYSL_START
D port status	Time (second) to process
	Contents of process

- When the D port status is FFFFh (normal status), go to Procedure 3.
- When the D port status falls into any status in Table 2-3, execute Check 1.

Table 2-3 Debug port (Boot mode) error status (1/10)

D port status	Inspection items	Details
	Permission of A20 and Clear of software reset bit	
	Prohibition of APIC	
	Initialization of MCHM, ICHM	
	Initialization of Super I/O	
	Initialization of debug port	
	Dummy read of 3 <sup>rd</sup> Bus data	
	Setting of printer port (for models supporting printer)	
F000h	PIT CH0 initialization (for HOLD_ON)	
	BIOS rewrite factor flag initialization	
	CHECK SUM CHECK	Transition to protected mode
		Boot block checksum (skipped when returned to S3) Halts when error occurs
	Checksum other than boot block (skip when returned to S3)	
F001h	EC/KBC rewrite check	If "rewrite" is requested, go to "BIOS rewrite process".
	Transition of process to system BIOS IRT when returned to S3	
	Key input	When a key is pressed, check if it is Tilde key or Tab key.
F002h	Initialization of SC	Halts when error occurs. Dport=F1B3h or B4h
F006h	BIOS rewrite request check	If Checksum check error occurred on except Boot Block or rewrite is required by user, go to "BIOS rewrite process".
F007h	Transits to system BIOS IRT.	
	BIOS rewrite process	Initialization of ICHM. D31
		DRAM configuration
		Permission of cache (L1 cache only)
		Memory clear
	Transits to real mode and copies BIOS to RAM.	

Table 2-3 Debug port (Boot mode) error status (2/10)

D port status	Inspection items	Details	
F009h	Saving key scan code		
	Setting TASK_1ms_TSC		
	Controlling fan		
	Initializing sound items (for BEEP)	Enabling system speaker	
		Releasing mute	
		Making the volume max	
	When BIOS, EC/KBC rewriting is requested	Blinks green (cycle:2s, on:1s, off:1s)	
	When BIOS ROM is abnormal	Blinks orange (cycle:2s, on:1s, off:1s)	
	When BIOS renewal is prohibited	Blinks 8 second cycle (On:4s, Off:4s). Beeps 30 second and halts Dport=F1BBh.	
	Key input	Temporary prohibition of USB	
		Beeps.	
		Waiting for key input	
	Reading CHGBIOSA.EXE / CHGFIRMA.EXE	FDC reset	
		Setting parameters for 2HD(1.44MB)	
Reading of first sector, If it is the data of 1.44MB (2HD), the media type is definite.			
Setting of parameters for 2DD (720KB)			
Retrieval of "CHGBIOSA.EXE" from the root directory. Calculation of directory start head and sector Read 1 sector of the root directory Retrieval of entry of "CHGBIOSA.EXE" / "CHGFIRMA.EXE" from the sector read.			
Reading of EXE header of "CHGBIOSA.EXE" and "CHGFIRMA.EXE"			
Key input when error occurred.			
	Execution of "CHGBIOSA.EXE" and "CHGFIRMA.EXE"		
(F007h)			
F100h	Renewal of micro code (Model supporting HTT)		
	Prohibition of cache		



Table 2-3 Debug port (Boot mode) error status (3/10)

D port status	Inspection items	Details
(F100h)	Initialization of H/W (before DRAM recognition)	Initialization of MCHM
		Initialization of ICH6M.D31.Func0
		Initialization of ICH6M.D31.Func1
		Initialization of ICH6M.D31.Func1/2
		Initialization of USB controller
		Initialization of ICH6M.D31.Func3
		Initialization of ICH6 AC97 Audio
	Initialization of TI controller	
	Initialization of PIT channel 1	(Setting the refresh interval to "30 $\mu$ s")
F101h	Checking DRAM type and size (at cold boot)	When unsupported memory is connected, the system beeps and halts. When DRAM size = 0, halts.
	Testing the stack area of SM-RAM	When it can not be used as stack area, halts.
F102h	Configuring cache memory	
	Permission of L1/L2 cache memory	
	Checking the access of a CMOS (Only in Cold Boot)	When error is detected, halts
	Examining the battery level of CMOS	
	Checksum check of CMOS	
	Initializing data in CMOS (1)	
	Setting up of IRT status	(Setting of boot status and IRT busy flag, The rest bits are set to 0)
	Storing the size of DRAM	
F103h	Branch of resuming (only in Cold Boot)	When a CMOS error is detected, it does not resume.
		If "resume status code" is not set, no resume occurs.

Table 2-3 Debug port (Boot mode) error status (4/10)

D port status	Inspection items	Details
(F103h)		Resume error check S3 recovery error (ICH)      Resume error 7AH SM-RAM checksum check      Resume error 73H Memory configuration change check Resume error 73H Checksum check of system BIOS RAM area Resume error 79H Checksum check of expansion memory Resume error 76H Checksum check of PnP RAM Resume error 77H To resume process (RESUME_MAIN)
	To resume error process	Returns the CPU clock to "Low"
		Prohibition of all SMIs
		Clears resume status
		Returns to ROM
		Forwards the area of C0000h to EFFFFh to PCI (prohibition of DRAM)
Sets resume error request		
Copying ROM/RAM of system BIOS	Halts, when error occurred	
F105h	SMRAM initialization	
	Check if CPU corresponds to Hyper Threading	
	Initialization of APIC	
	WakeUp factor check	
	SMRAM base rewriting and CPU state map saving for BIOS	
	Permission of SMI based on ASMI	

Table 2-3 Debug port (Boot mode) error status (5/10)

D port status	Inspection items	Details		
F106h	Initialization of devices which need initialization before PCI bus initialization	PIT test (at Cold boot only) and initialization Setting of test pattern to channel 0 of PIT#0 Check whether the set test pattern can be read. Initialization of PIT channel 0 (Setting of timer interruption interval to 55ms) Initialization of PIT channel 2 (Setting of the sound generator frequency to 664Hz) Test of PIT channel 1 (Check whether the refresh signal works properly in 30 micro-s refresh interval.) The system halts when the time is out. Test of PIT channel 2 (Check whether the speaker gate works properly)		
		CPU clock measurement		
		Check of parameter block A		
		Permission of SMI except auto-off function		
		Control of excess of rated input power		
		Battery discharge current control (1CmA)		
		AC adapter rated over current control		
		Dividing procedures for time measuring by IRT		
		Setting for clock generator		
		Checking parameter tab lock A		
		CPU Initialization Updating micro-code Judging of CPU type Geyserville support check Setting of CPU clock to "high"		
		F107h	Saving memory configuration to buffer	
			Reading of EC version	
Update of flash ROM type				
Judging of destination (Japan or except Japan) based on DMI data				
CMOS default setting check	Sets default setting if bad battery or bad checksum (ROM, CMOS) is detected.			
ACPI table initialization (for execution of option ROM)				

Table 2-3 Debug port (Boot mode) error status (6/10)

D port status	Inspection items	Details
(F107h)	Initialization of devices which need initialization before PCI bus initialization	Setting operation mode of IDE device
		Setting operation mode of AC'97/Azalia
		Initialization of temperature control information
		KBC initialization
		VGA display off, Reset control
		Sound initialization
		PC multi-box status acquisition
		HC initialization, USB device connection recognition and initialization
		Recognizing an initializing of SD memory card
	Control of built-in LAN permission/prohibition	
	PIC initialization	
	PIC test	
	Password Initialization	
F108h	PCI bus initialization (connection of DS Bus)	
	Initialization of LAN information	
	Check of WakeUp factor	
F109h	Task generation for waiting INIT_PCI completion	
	CMOS data initialization (2)	
	PnP initialization	
	Setting of setup items	
	Waiting for the completion of Multi-box status check	
	H/W setting based on resource	
F10AH	Task generation for waiting PnP resource making completion	
	Serial interruption control	(before use of interruption) (for models supporting YEBISU)
	PnP H/W initialization	PC card slot initialization
		SIO initialization (for models supporting SIO)
		FIR initialization (for models supporting FIR)

Table 2-3 Debug port (Boot mode) error status (7/10)

D port status	Inspection items	Details
(F10Ah)	PCI automatic configuration	Making of work for automatic configuration
		Acquisition of PCI IRQ
		Configuration
		Saving of VGA configuration result
F10Bh	Task generation for waiting PCI_CONFIGURATION completion	
	Initialization of H/W needed after PCI configuration	Printer port setting (for models supporting printer)
		HDD initialization sequence start
		FDD initialization sequence start (for models supporting built-in FDD)
	Enabling power off	
Output code generation		
F10Ch	FIRST_64KB_CHECK	(Check of first 64KB memory)
F10Dh	INIT_INT_VECTOR	(Initialization of vectors)
F10Eh	INIT_NDP	(Initialization of NDP)
F10Fh	INIT_SYSTEM (Initialization of system)	Storing of CMOS error status to IRT_ERR_STS_BUF
		Timer initialization start
		EC initialization & Reading of battery information
		Update of system BIOS (Update of EDID information for LCD)
F110h	INIT_DISPLAY (Waiting for VGA chip initialization completion, VGA BIOS initialization)	
F111h	Calling VGA BIOS	
F113h	DISP_LOGO	Displaying logo
F114h	SYS_MEM_CHECK (boot mode)	Check of convention memory
F115h	EXT_MEM_CHECK (boot mode)	Check of exception in the protected mode
F116h	Exception check in the protected mode	Dport=F117h when error occurs
	INIT_SYS_MEM (reboot mode)	Initialization of conventional memory
F118h	CHK_DMA_PAGE (boot mode)	Check of DMA Page Register
F119h	CHECK_DMACH (boot mode)	Check of DMACH

Table 2-3 Debug port (Boot mode) error status (8/10)

D port status	Inspection items	Details
F11Ah	INIT_DMACH (boot mode)	Initialization of DMACH
F11Bh	CHECK_PRT (for models supporting printer)	Check of printer port existence
F11Ch	CHECK_SIO (for models supporting SIO)	Check of SIO
F11Dh	BOOT_PASSWORD (password check)	<p>Waiting for FDD initialization completion (for models supporting built-in FDD)</p> <p>(In Reboot Mode)            Waiting for HDD initialization completion            Check of key input during IRT (waiting for KBC initialization completion)            ATA priority initialization</p> <p>(In Boot Mode)            BM loading process (for models supporting fingerprint authentication)            Initialization of BM (for models supporting fingerprint authentication)            Check of key input during IRT (waiting for KBC initialization completion)            Input of password            I/O LOCK process (for models supporting I/O lock)            Opening BM (for models supporting fingerprint authentication)</p>
F11Eh	EX_IO_ROM_CHECK	Check of option I/O ROM
F11Fh	PRE_BOOT_SETUP	<p>Saving of value in 40:00h (for SIO saving/restoring)</p> <p>Setting of font address for resume password</p> <p>Setting of repeat parameter for USB KB</p> <p>Final check of key input during IRT</p> <p>Storing of T_SHADOW_RAM_SIZE</p> <p>Update of system resource just before booting</p> <p>Rewriting of memory map data of INT15h E820h function</p> <p>Waiting for AC-Link initialization completion</p> <p>Renewal of table for DMI</p> <p>Copying ACPI table to uppermost of extension memory</p> <p>Waiting for completion of BIOS rewriting of PSC version</p>

Table 2-3 Debug port (Boot mode) error status (9/10)

D port status	Inspection items	Details
(F11Fh)		Waiting for completion of initialization of Serial port (for models supporting SIO)
		Waiting for completion of setting clock generator When error occurred, halts at Dport=F120h
		Cancel of NMI Mask
		TIT check sum
		Clear of the IRT flag of Runtime side
		Update of check sum of Runtime side
		Hibernation branch (for models supporting BIOS Hibernation)
		Initialization of Bluetooth (for models supporting Bluetooth)
		Check of existence of target maintenance card
		Prohibition of unused PC card
		Setting Wakeup status data for ACPI
		HW initialization just before booting, Waiting for initialization completion
		Notifies the DVI connection status to VGA BIOS (for models supporting DVI)
		Setting of battery save mode
Setting of date		
Waiting for Bluetooth initialization completion (for models supporting Bluetooth)		
Update of DMI Wakeup factor, Update of SM-BIOS structure table		
PCI device configuration space close		
Cache control		
Process for CPU Make the CPU clock to be set by SETUP		
Waiting of motor-off completion of disabled HDD		
Final decision of USB FDD drive information		
Post processing of PRE_BOOT_SETUP		
Clear of PWRBTN_STS		
Enabling POWER Button		

Table 2-3 Debug port (Boot mode) error status (10/10)

D port status	Inspection items	Details
F121h	Clear of IRT status	
	Update of check sum of Runtime side	
FFFFh	End	

Check 1 If the D port is status F11Dh or F11Fh is displayed, go to “HDD Trouble shooting Procedure in Section 2.6.

Check 2 If any other D port status error code is displayed, perform Procedure 3.

D port error code is as follows:

Error code	Contents
F117h	Exception error
F120h	Clock generator error
F11B3h/F11B4h	SC initialization error
F1BBh	BIOS update error



**Procedure 3 Diagnostic Test Program Execution Check**

Execute the following tests from the Diagnostic Test Menu. These tests check the System board. Refer to Chapter 3, *Tests and Diagnostic*, for more information on how to perform these tests.

1. System test
2. Memory test
3. Keyboard test
4. Display test
5. Floppy Disk test
6. Printer test
7. ASYNC test
8. Hard Disk test
9. Real Timer test
10. NDP test
11. Expansion test
12. CD-ROM/DVD-ROM test
13. Wireless LAN test
14. LAN/Modem/Bluetooth/IEEE1394 test
15. Sound test

If an error is detected during these tests, go to Procedure 4.

**Procedure 4 Replacement Check**

The System board connectors may be disconnected. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform Check 1.

Check 1 Visually check for the following:

- a) Cracked or broken connector housing
- b) Damaged connector pins

If connectors are in good condition, but there is still a problem, go to Check 2.

Check 2 The System board may be damaged. Replace the System board with a new one following the steps described in Chapter 4, *Replacement Procedures*.

## 2.5 USB 3.5" FDD Troubleshooting

This section describes how to determine if the USB 3.5" FDD is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: FDD Head Cleaning Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector Check and Replacement Check

### Procedure 1 FDD Head Cleaning Check

FDD head cleaning is one option available in the Diagnostic Program.

Insert the Diagnostics Disk in the USB floppy disk drive, turn on the computer and run the test. And then clean the FDD heads using the cleaning kit. If the FDD still does not function properly after cleaning, go to Procedure 2.

Detailed operation is given in Chapter 3, *Tests and Diagnostics*.

If the test program cannot be executed on the computer, go to Procedure 3.

## Procedure 2 Diagnostic Test Program Execution Check

Insert the Diagnostics Disk in the USB FDD, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics*, for more information about the diagnostics test procedures.

Make sure the floppy disk is formatted correctly and that the write protect tab is disabled. Floppy disk drive test error codes and their status names are listed in Table 2-4. If any other errors occur while executing the FDD diagnostics test, go to Check 1.

Table 2-4 FDD error code and status

Code	Status
01h	Bad command
02h	Address mark not found
03h	Write protected
04h	Record not found
06h	Media replaced
08h	DMA overrun error
09h	DMA boundary error
10h	CRC error
20h	FDC error
40h	Seek error
60h	FDD not drive
80h	Time out error (Not ready)
EEh	Write buffer error
FFh	Data compare error

Check 1 If the following message is displayed, disable the write protect tab on the floppy disk by sliding the write protect tab to “write enable”. If any other message appears, perform Check 2.

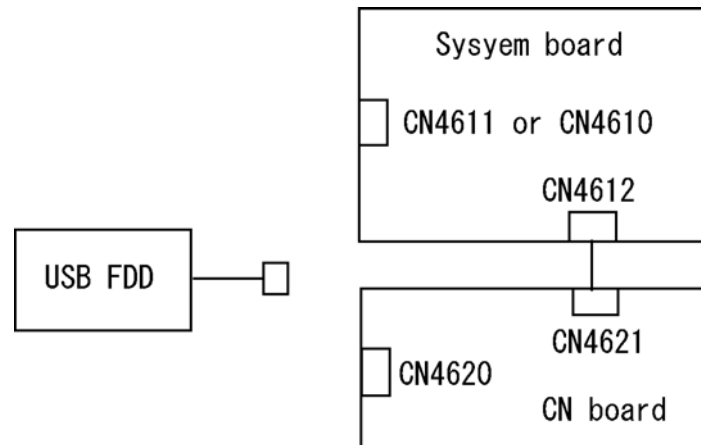
Write protected

Check 2 Make sure the floppy disk is formatted correctly. If it is, go to Procedure 3.

### Procedure 3 Connector Check and Replacement Check

The USB FDD connector may be disconnected from the connector on the System board. Check visually that the connector is connected firmly.

- Check 1 Make sure the USB FDD cable is firmly connected to the CN4611 (port 3) or CN4610 (port 0) of the System board, or CN4620 (port 5) of the CN board.



If the connection is loose, reconnect firmly and repeat Procedure 2. If there is still an error, go to Check 2.

- Check 2 The USB FDD may be defective or damaged. Replace it with a new one. If the FDD is still not functioning properly, perform Check 3 when the USB FDD is connected to CN4620 (port 5) or Check 5 when the USB FDD is connected to CN4611/CN4610 (port 3/0).
- Check 3 The connection between the CN board and the System board may be loose. Reconnect the cable between them firmly. If the FDD is still not functioning properly, perform Check 4.
- Check 4 The CN board may be defective or damaged. Replace it with a new one. If the FDD is still not functioning properly, perform Check 5.
- Check 5 Replace the System board with a new one following the steps in Chapter 4, *Replacement Procedures*.

## 2.6 2.5" HDD Troubleshooting

This section describes how to determine if the 2.5" HDD is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

- Procedure 1: Partition Check
- Procedure 2: Message Check
- Procedure 3: Format Check
- Procedure 4: Diagnostic Test Program Execution Check
- Procedure 5: Connector Check and Replacement Check

**CAUTION:** *The contents of the 2.5" hard disk will be erased when the 2.5" HDD troubleshooting procedures are executed. Transfer the contents of the hard disk to floppy disks or other storage drive(s). For the backup, refer to the User's Manual.*

### Procedure 1 Partition Check

Insert the Toshiba MS-DOS system disk and start the computer. Perform the following checks:

- Check 1 Type **C:** and press **Enter**. If you cannot change to drive C, go to Check 2. If you can change to drive C, go to Procedure 2.
- Check 2 Type **FDISK** and press **Enter**. Choose Display Partition Information from the FDISK menu. If drive C is listed in the Display Partition Information, go to Check 3. If drive C is not listed, return to the FDISK menu and choose the option to create a DOS partition or a logical DOS drive on drive C. If the problem still exists, go to Procedure 2.
- Check 3 If drive C is listed as active in the FDISK menu, go to Check 4. If drive C is not listed as active, return to the FDISK menu and choose the option to set the active partition for drive C. Then go to Procedure 2.
- Check 4 Remove the system disk from the FDD and reboot the computer. If the problem still exists, go to Procedure 2. Otherwise, the HDD is operating normally.

## Procedure 2 Message Check

When the power is turned on, the system performs the Initial Reliability Test (IRT) installed in the BIOS ROM. When the test detects an error, an error message is displayed on the screen.

Make sure of no floppy disk in the FDD. Turn on the computer and check the message on the screen. When an OS starts from the 2.5" HDD, go to Procedure 3. Otherwise, start with Check 1 below and perform the other checks as instructed.

Check 1 If any of the following messages appear, go to Procedure 3. If the following messages do not appear, perform Check 2.

HDC ERROR

or

HDD #X ERROR (After 5 seconds this message will disappear.)

Check 2 If either of the following messages appears, go to Check 3. If the following messages do not appear, perform Check 4.

Insert system disk in drive

Press any key when ready .....

or

Non-System disk or disk error

Replace and press any key when ready

Check 3 Using the SYS command of the MS-DOS, transfer the system to the 2.5" HDD. If the system is not transferred, go to Procedure 3. Refer to the MS-DOS Manual for detailed operation.

If the following message appears on the display, the system program has been transferred to the HDD.

System Transferred

If an error message appears on the display, perform Procedure 3.

Check 4 The 2.5" HDD, HD board and the connector of the System board may be disconnected (Refer to the steps described in Chapter 4, *Replacement Procedures* for disassembling the PC.). Reconnect them firmly. If they are firmly connected, go to Procedure 3.

**Procedure 3    Format Check**

The computer's 2.5" HDD is formatted using the MS-DOS FORMAT program or the physical format program of the test program. To format the 2.5" HDD, start with Check 1 below and perform the other steps as required.

Refer to the MS-DOS Manual for the operation of MS-DOS. For the format by the test program, refer to the Chapter 3.

Check 1    Format the 2.5" HDD using MS-DOS FORMAT command. Type as **FORMAT C:/S/U**.

          If the 2.5" HDD can not be formatted, perform Check 2.

Check 2    Using the MS-DOS FDISK command, set the 2.5" HDD partition. If the partition is not set, go to Check 3. If it is set, format the 2.5" HDD using MS-DOS FORMAT command.

Check 3    Using the Diagnostic Disk, format the 2.5" HDD with a format option (physical format). If the 2.5" HDD is formatted, set the 2.5" HDD partition using MS-DOS FDISK command.

          If you cannot format the 2.5" HDD using the Tests and Diagnostic program, go to Procedure 4.

#### Procedure 4 Diagnostic Test Program Execution Check

The HDD test program is stored in the Diagnostics Disk. Perform all of the HDD tests in the Hard Disk Drive Test. Refer to Chapter 3, *Tests and Diagnostics*, for more information about the HDD test program.

If an error is detected during the HDD test, an error code and status will be displayed. The error codes and statuses are described in Table 2-5. If an error code is not displayed but the problem still exists, go to Procedure 5.

Table 2-5 2.5" HDD error code and status

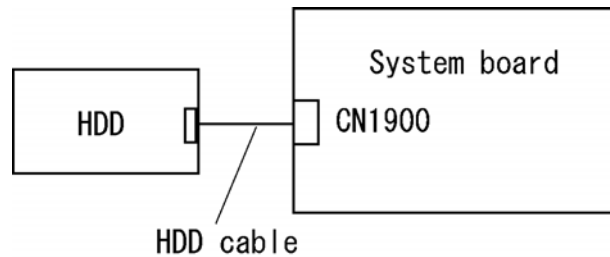
Code	Status
01h	Bad command
02h	Address mark not found
04h	Record not found
05h	HDC not reset
07h	Drive not initialized
08h	HDC overrun error (DRQ)
09h	DMA boundary error
0Ah	Bad sector error
0Bh	Bad track error
10h	ECC error
11h	ECC recover enable
20h	HDC error
40h	Seek error
80h	Time out error
AAh	Drive not ready
BBh	Undefined error
CCh	Write fault
E0h	Status error
EEh	Access time out error
DAh	No HDD



**Procedure 5 Connector Check and Replacement Check**

The HDD is connected to the System board with a HDD cable. The connecting portions may be loose. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks to check the connecting portions:

- Check 1 Make sure the HDD cable is firmly connected to the connector CN1900 of the System board and HDD.



If connection is loose, reconnect firmly and repeat Procedure 4. If there is still an error, go to Check 2.

- Check 2 The 2.5" HDD may be damaged. Replace it with a new one and check the operation. If the problem still exists, perform Check 3.
- Check 3 The System board may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

## 2.7 Keyboard Troubleshooting

To determine if the computer's keyboard is functioning properly, perform the following procedures. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

### Procedure 1 Diagnostic Test Program Execution Check

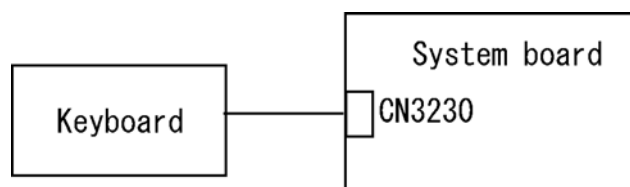
Execute the Keyboard Test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

If an error occurs, go to Procedure 2. If an error does not occur, the keyboard is functioning properly.

### Procedure 2 Connector Check and Replacement Check

The keyboard or System board may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks:

Check 1 Make sure the keyboard cable is firmly connected to the connector CN3230 on the System board.



If the connection is loose, reconnect the cable firmly and repeat Procedure 1. If there is still an error, go to Check 2.

Check 2 The keyboard may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 3.

Check 3 The System board may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

## 2.8 Display Troubleshooting

This section describes how to determine if the computer's display is functioning properly. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: External Monitor Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector and Cable Check

Procedure 4: Replacement Check

### Procedure 1 External Monitor Check

Connect an external monitor to the computer's external monitor port, and then boot the computer. The computer automatically detects the external monitor.

If the external monitor works correctly, the internal LCD may be damaged. Go to Procedure 3.

If the same problem as the internal monitor appears on the external monitor, the System board may be damaged. Go to Procedure 2.

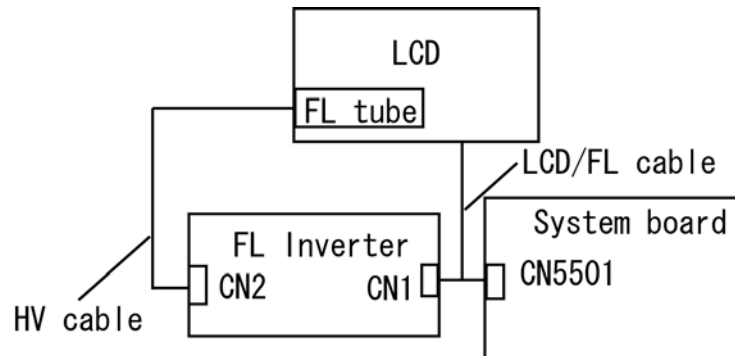
### Procedure 2 Diagnostic Test Program Execution Check

The Display Test program is stored on the Diagnostics disk. Insert the Diagnostics disk in the USB floppy disk drive, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics* for details.

This program checks the display controller on the System board. If an error is detected, go to Procedure 3.

### Procedure 3 Connector and Cable Check

The LCD module is connected to the System board through the LCD/FL cable. Also, the FL inverter is connected the System board through the LCD/FL cable. The cable may be firmly disconnected the board or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*. If the connection is loose, reconnect the cable firmly and repeat Procedure 2. If there is still an error, go to Procedure 4.



### Procedure 4 Replacement Check

- (1) If characters or graphics are not displayed on the internal display, perform Check 1.
- (2) If characters or images are displayed on the internal display but the display is not normal, perform Check 2.
- (3) If characters or images are displayed on the internal display but the display is dark (the back-light does not light), perform Check 5.

Check 1 The display ON/OFF switch may be damaged. Remove the display ON/OFF switch and repeat Procedure 4. If there is still an error, go to Check 2.

Check 2 The LCD/FL cable may be damaged. Replace the damaged cable with a new one and repeat Procedure 4. If there is still an error, go to Check 3.

Check 3 The LCD module may be damaged. Replace it with a new one and repeat Procedure 4. If there is still an error, go to Check 4.

Check 4 The FL inverter may be damaged. Replace it with a new one and repeat Procedure 4. If there is still an error, go to Check 5.

Check 5 The FL tube may be damaged. Replace it with a new one and repeat Procedure 4. If there is still an error, go to Check 6.

Check 6 The display controller of the System board may be damaged. Replace the System board with a new one.

## 2.9 Touch pad Troubleshooting

To determine whether the Touch pad is faulty or not, perform the following procedures:

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector and Cable Check

Procedure 3: Replacement Check

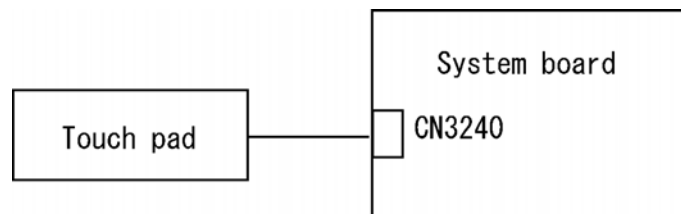
### Procedure 1 Diagnostic Test Program Execution Check

Execute the test for Touch pad in ONLY ONE test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

If an error occurs, go to Procedure 2. If an error does not occur, the Touch pad keyboard is functioning properly.

### Procedure 2 Connector and Cable Check

The Touch pad is connected to the connector CN3240 on the System board with a flexible cable. This cable may have come off the connector of the touch pad or of the System board. Disassemble the computer and check the cable connections. See Chapter 4 for the disassembly procedure. If the cable has come off, connect firmly it and make sure the operation. If there is still an error, go to Procedure 3.



### Procedure 3 Replacement Check

Check 1 The Touch pad may be damaged. Replace it with a new one and repeat Procedure 1. If there is still an error, go to Check 2.

Check 2 The System board may be damaged. Replace the System board with a new one according to the procedure in Chapter 4.

## 2.10 Selectable bay (optical drive) Troubleshooting

The Selectable bay can be installed in this model and the Selectable bay optical drive is installed as standard. Here explains the troubleshooting for the optical drive.

To check if the optical drive is defective or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

### Procedure 1 Diagnostic Test Program Execution Check

Prepare the tools before the test. (Refer to tools for implementing the Diagnostics procedures on Chapter 3.)

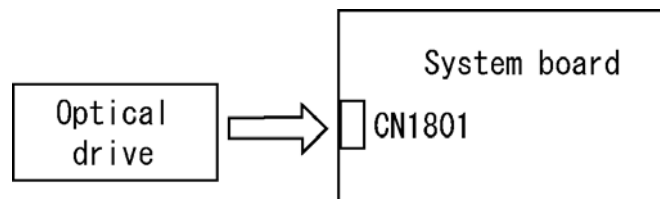
Execute the CD-ROM/DVD-ROM Test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

If any error is detected by the test, go to Procedure 2.

### Procedure 2 Connector Check and Replacement Check

The optical drive may be disconnected from the System board or faulty. Disassemble the computer following the steps described in Chapter 4 and perform the following checks:

Check 1 Make sure the optical drive is firmly connected to the connector CN1801 on the System board.



If the connection is loose, reconnect it firmly and return to Procedure 1. If there is still an error, perform Check 2.

Check 2 The optical drive may be faulty. Replace the optical drive with a new one following the steps in Chapter 4. If the problem still occurs, perform Check 3.

Check 3 The System board may be faulty. Replace it with new one following the instructions in Chapter 4.

## 2.11 Modem Troubleshooting

To check if the modem is defective or malfunctioning, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

### Procedure 1 Diagnostic Test Program Execution Check

Execute the Modem test program available as part of the maintenance test program. This program checks the modem. See Chapter 3 for information on how to perform the test.

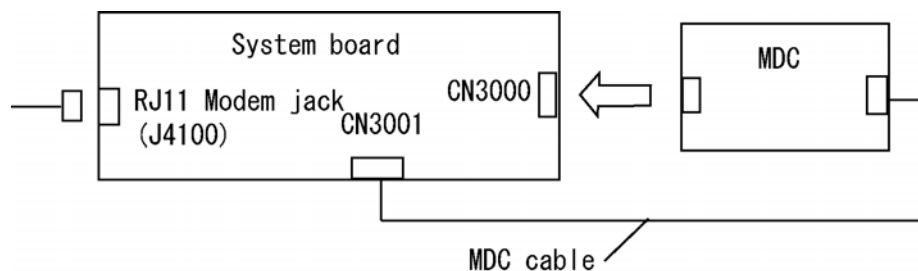
If any error is detected by the test, go to Procedure 2.

### Procedure 2 Connector Check and Replacement Check

The Modem jack (RJ11) is mounted on the System board and MDC is connected to the System board. If the modem malfunctions, the connection may be bad or the MDC or System board might be faulty.

Disassemble the computer following the steps described in Chapter 4 and perform the following checks:

Check 1 Make sure the MDC is firmly connected to the CN3000 and the MDC cable is connected to the CN3001 on the System board.



If any connector is disconnected, connect it firmly and return to Procedure 1. If there is still an error, perform Check 2.

Check 2 The MDC may be faulty. Replace it with a new one following the steps in Chapter 4. If the modem is not still working properly, perform Check 3.

Check 3 The System board may be faulty. Replace it with a new one following the instructions in Chapter 4.

## 2.12 Bluetooth Troubleshooting

This section describes how to determine if the Bluetooth in the computer is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connection Check

Procedure 3: Replacement Check

### Procedure 1 Diagnostic Test Program Execution Check

Make sure the wireless switch on the left side of the computer is turned “On”. If it is not, slide the switch toward the back of the computer to turn it on.

Check 1 Execute Bluetooth test program. Perform the test following the instructions described in Chapter 3, Bluetooth Test Program. You will need a second computer that can communicate by the Bluetooth.

If the computer passes the test, the function is correctly working. If the computer does not pass the test, go to check 2.

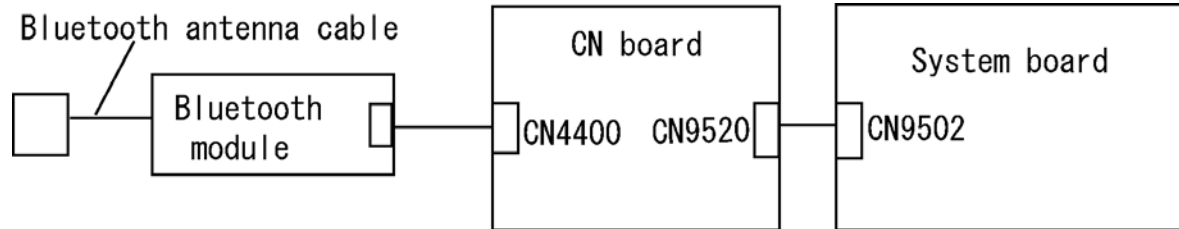
Check 2 The Bluetooth module may be defective or damaged. Replace it with a new one. Then perform the test program again.

If the computer still does not pass the test, go to Procedure 2.



## Procedure 2 Connection Check

The Bluetooth functional wiring diagram is shown below:



Any of the connections may be disconnected. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

- Check 1 Make sure the flexible cable is firmly connected to connector on the Bluetooth module and CN4400 on the CN board. If the connector is disconnected, connect it firmly and perform Procedure 1. If the Bluetooth module is still not functioning properly, perform Check 2.
- Check 2 Make sure the Bluetooth antenna cable (brown) is firmly connected to the Bluetooth module. If the Bluetooth antenna cable is disconnected, connect it firmly and perform Procedure 1. If the Bluetooth function is still not functioning properly, perform Check 3.
- Check 3 Make sure the cable is firmly connected to CN9520 on the CN board and CN9502 on the System board. If the flexible cable is disconnected, connect it firmly and perform Procedure 1. If the Bluetooth function is still not functioning properly, go to procedure 3.

**Procedure 3 Replacement Check**

The Bluetooth antenna, Bluetooth module, CN board and System board are connected to the circuits. Any of these components may be damaged. Refer to Chapter 4, *Replacement Procedures*, for instructions on how to disassemble the computer and then perform the following checks:

- Check 1 Any of the cables may be defective or damaged. Replace the cable with a new one following the steps in Chapter 4, *Replacement Procedures*. If the Bluetooth is still not functioning properly, perform Check 2.
- Check 2 The Bluetooth module may be defective or damaged. Replace the Bluetooth module with a new one following the steps in Chapter 4, *Replacement Procedures*. If the Bluetooth is still not functioning properly, perform Check 3.
- Check 3 The CN board may be defective or damaged. Replace the CN board with a new one following the steps in Chapter 4, *Replacement Procedures*. If the Bluetooth is still not functioning properly, perform Check 4.
- Check 4 The Bluetooth antenna may be defective or damaged. Replace the Bluetooth antenna with a new one following the steps in Chapter 4, *Replacement Procedures*. If the Bluetooth is still not functioning properly, perform Check 5.
- Check 5 The System board may be defective or damaged. Replace the System board with a new one following the steps in Chapter 4, *Replacement Procedures*.

## 2.13 LAN Troubleshooting

To check if the computer's LAN is defective or malfunctioning, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

### Procedure 1 Diagnostic Test Program Execution Check

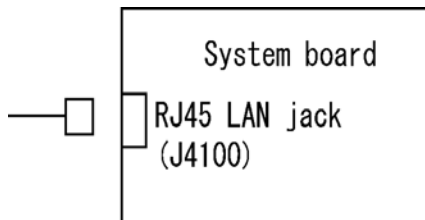
To check the LAN function, execute the Sound/LAN/Modem test program subtest 04 (LAN test). See Chapter 3 for information on how to perform the test.

If any error is detected by the test, go to Procedure 2.

### Procedure 2 Connector Check and Replacement Check

The LAN function is installed on the System board and the RJ45 jack and the controller is mounted on the System board. If the LAN malfunctions, the System board might be faulty.

Disassemble the computer following the steps described in Chapter 4 and replace the System board.



## 2.14 Sound Troubleshooting

To check if the sound function is defective or malfunctioning, follow the troubleshooting procedures below as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check

Procedure 3: Replacement Check

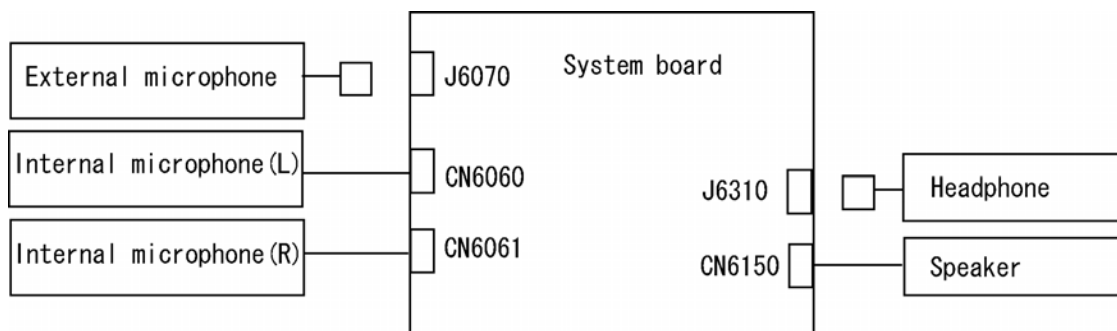
### Procedure 1 Diagnostic Test Program Execution Check

Execute the Sound test program available as part of the maintenance test program. See Chapter 3 for information on how to perform the test.

If any error is detected by the test, go to Procedure 2

### Procedure 2 Connector Check

The speaker, internal microphones, external microphone and headphone are connected to the System board shown in the following figure. These connections may be loose or cables may come off. Disassemble the computer referring to the steps described in Chapter 4 and make sure each connection. If there is still an error, perform Procedure 3.



### Procedure 3 Replacement Check

- Check 1 If the external speaker or headphone is not working properly, it may be faulty. Replace it with a new one. If there is still an error, perform Check 2.
- Check 2 If the speaker or internal microphones is not working properly, it may be faulty. Replace it with a new one following the step in Chapter 4. If there is still an error, go to Check 3.
- Check 3 The System board may be faulty. Replace it with a new one following the step in Chapter 4.

## 2.15 SD Card Slot Troubleshooting

To check if the SD card slot is good or no good, follow the troubleshooting procedures below as instructed.

Procedure 1: Check on Windows XP Tablet PC Edition

Procedure 2: Connector Check and Replacement Check

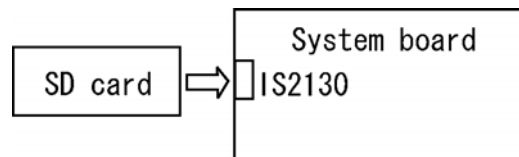
### Procedure 1 Check on Windows XP Tablet PC Edition

Insert an SD card into the slot. Check if the installed Windows XP Tablet PC Edition recognizes automatically the SD card and the data in the SD card can be read.

If the card is not recognized or data are not read, go to Procedure 2.

### Procedure 2 Connector Check and Replacement Check

The SD card is connected to the connector IS2130 of the connector board.



- Check 1 The SD card and the System board may be disconnected. Make sure the SD card is firmly inserted to the IS2130 of the System board. If the SD card is still not functioning properly, perform Check 2.
- Check 2 The SD card may be faulty. Replace it with a new one following the step in Chapter 4. If the problem continues, perform Check 3.
- Check 3 The System board may be faulty. Replace it with a new one following the step in Chapter 4.

## 2.16 Tablet Pen Troubleshooting

To check if the Tablet Pen is defective or not, follow the troubleshooting procedures below as instructed.

**CAUTION:** Use the Tablet Pen supplied to this model.

Procedure 1: Check on Windows XP Tablet PC Edition

Procedure 2: Tablet pen replacement Check

Procedure 3: Connector Check and Replacement Check

### Procedure 1 Check on Windows XP Tablet PC Edition

This procedure checks if the tablet pen is working properly by using the function of Windows XP Tablet Edition.

Check 1 Make sure the mouse cursor is following the tablet pen when you move the pen on the display. If it does not work properly, go to Procedure 2.

Check 2 Make sure the “click” function works properly when you tap (touch) the display with the tablet pen. If it does not work properly, go to Procedure 2.

When both the functions work correctly, the tablet pen is not defective.

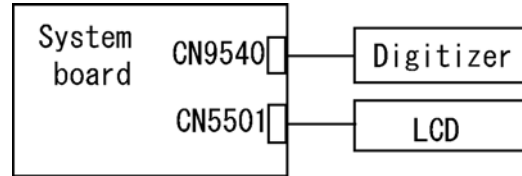
### Procedure 2 Tablet pen replacement Check

Check 1 The core of the tablet pen might be worn out. Replace the core with a new one following the steps in the User’s manual, and check the tablet pen is working properly. If there is still an error, go to Check 2.

Check 2 The tablet pen might be defective. Replace the tablet pen with a new one and check if the tablet pen is working properly. If there is still an error, execute Procedure 3.

**Procedure 3 Connector Check and Replacement Check**

The Digitizer and LCD are connected to the System board as below.



- Check 1 The Digitizer may be disconnected. Make sure the Digitizer is connected to the CN9540 on the System board. If there is still an error, go to Check 2.
- Check 2 The LCD might be disconnected. Make sure the LCD is connected to the CN5501 on the System board. If there is still an error, go to Check 3.
- Check 3 The Digitizer, the LCD or the System board may be defective. Replace it with a new one following the steps in Chapter 4. Then check the tablet pen is working properly.

## 2.17 Wireless LAN Troubleshooting

To check if the Wireless LAN is defective or not, follow the troubleshooting procedures below as instructed.

Procedure 1: Transmitting/Receiving Check

Procedure 2: Check of Antenna connection

Procedure 3: Replacement Check

### Procedure 1 Transmitting/Receiving Check

Make sure the wireless communication switch on the computer is turned ON. If it is not, turn ON.

Check 1 Execute test program for the wireless LAN function to check the transmitting/receiving function of the wireless LAN. You will need another computer that can communicate by the wireless LAN.

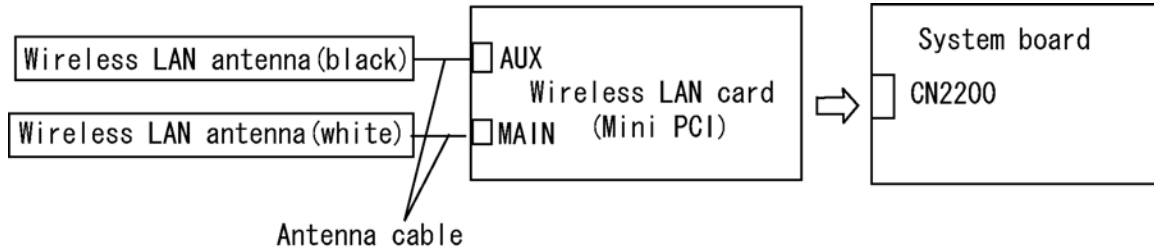
If the computer passes the test, the function is correctly working.

If the computer does not pass the test, perform Procedure 2.



## Procedure 2 Check of Antenna connection

The wireless LAN functional wiring diagram is shown below:



Any of the connections may be disconnected. Disassemble the computer following the steps described in Chapter 4, and perform the following checks:

**Check 1** The wireless LAN card and the System board may be disconnected. Make sure the wireless LAN card is firmly connected to the CN2200 of the System board.

If the board connector is disconnected, connect it firmly and return to Procedure 1.  
If there is still an error, go to Check 2.

**Check 2** Make sure the wireless LAN antennas (black and white) are firmly connected to the Wireless LAN card. If the antennas are disconnected, connect firmly then return to Procedure 1. If there is still an error, perform Procedure 3.

## Procedure 3 Replacement Check

Check if the wireless LAN card and the System board are connected properly. If they are properly connected but there is still an error, any of these components may be damaged. Disassemble the computer following the steps described in Chapter 4 and replace the board with a new one.

**Check 1** The wireless LAN card may be defective or damaged. Disassemble the computer following the steps described in Chapter 4 and replace the board with a new one. If there is still an error go to Check 2.

**Check 2** The wireless LAN antennas may be defective or damaged. Disassemble the computer following the steps described in Chapter 4 and replace the board with a new one. If there is still an error go to Check 3.

**Check 3** The System board may be defective or damaged. Disassemble the computer following the steps described in Chapter 4 and replace the board with a new one.

---

# **Chapter 3**

## **Tests and Diagnostics**

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## 3.1 The Diagnostic Test

This chapter explains how to use the Diagnostic Test programs to test the functions of the computer's hardware modules. The Diagnostics Programs are stored on some Diagnostic Disks. There are Service Program Modules (DIAGNOSTIC MENU) and the Test Program Modules (DIAGNOSTIC TEST MENU) on the Diagnostic Disk.

The Hardware Initial information Setting Tool consists of some programs that write the hardware information or displays the current information of the computer. It is also included in one of Diagnostic Disks.

The heatrun test is automatic test program that executes the some tests successively.

**NOTE:** Before starting the diagnostics, be sure to follow these steps:

1. Check all cables are connected firmly.
2. Exit any application and close Windows.
3. Check if "ALL Device" is selected in the item [Device Config.] in SETUP menu. After checking the diagnostics, be sure to select "Setup by OS".

### 3.1.1 Diagnostics menu

The DIAGNOSTIC MENU consists of the following functions.

- DIAGNOSTIC TEST
- ONLY ONE TEST
- HEAD CLEANING
- LOG UTILITIES
- RUNNING TEST
- FDD UTILITIES
- SYSTEM CONFIGURATION
- EXIT TO MS-DOS

The DIAGNOSTIC TEST MENU contains the following functional tests.

- SYSTEM TEST
- MEMORY TEST
- KEYBOARD TEST
- DISPLAY TEST
- FLOPPY DISK TEST
- PRINTER TEST
- ASYNC TEST
- HARD DISK TEST



- REAL TIMER TEST
- NDP TEST
- EXPANSION TEST
- CD-ROM/DVD-ROM TEST

Other tests are:

- Wireless LAN TEST (Wireless LAN test disk)
- LAN/Modem/Bluetooth/IEEE1394 TEST (LAN/Modem/Bluetooth/IEEE1394 test disk)
- Sound TEST (Sound test disk)

You will need the following equipment to perform some of the Diagnostic test programs.

- USB FDD
- The Diagnostic Disks  
(T&D for maintenance, LAN/Modem/Bluetooth/IEEE1394 test disk for maintenance, Wireless LAN test disk for maintenance and Sound test disk for maintenance)
- A formatted working disk (Floppy disk test)
- A cleaning kit to clean the floppy disk drive heads (Head Cleaning)
- An external CRT monitor supporting monitor ID (Expansion test)
- A CD test media TOSHIBA CD-ROM TEST DISK or ABEX TEST CD-ROM (Sound test)
- A DVD test media (DVD-ROM TEST DISK TSD-1) (Sound test)
- A music CD (Sound test)
- A CD-RW test media (CD-ROM/DVD-ROM test)
- A USB test module (USB test )
- A USB cable (USB test)
- LAN wraparound connector (LAN test)
- Module cable and RJ11 connector checker (Modem test)
- Headphones (Sound test)
- A microphone (Sound test)
- A PC for wraparound test (Wireless LAN test/Bluetooth test/IEEE1394 test)
- PC card wraparound connector (Expansion test)
- RS-232C wraparound connector (Async test)

### 3.1.2 H/W (Hardware) initial information setting tool

The H/W initial information setting tool consists of the following programs.

- Initial configuration
- DMI information save
- DMI information recovery
- System configuration display
- E2PROM test (MAC/GUID/DMI)

You will need the following equipment to perform some of the programs.

- The Diagnostics Disk (Main T&D)

### 3.1.3 Heatrun test program

The heatrun test starts automatically after the selection.

You will need the following equipment to perform this program.

- The Diagnostics Disk (Main T&D)

## 3.2 Executing the Diagnostic Test

To start the DIAGNOSTIC PROGRAM, follow these steps:

1. Insert the Diagnostics disk in the floppy disk drive.
2. Release the lock of the power switch and turn on the computer with pressing the **F12**. Select the FDD in the display for selecting booting unit. Then, press **Enter** and the following menu appears.

```
Microsoft Windows XX Startup Menu  
-----
```

1. Repair Main (T&D)
2. Repair initial config set
3. Repair Heatrun (T&D)

```
Enter a choice: 1
```

To start the Diagnostics menu (T&D), press **1** and **Enter** .

To start the H/W initial information setting tool, press **2** and **Enter**.

To start the Heatrun test, press **3** and **Enter**.

**NOTE:** When replacing the System board, be sure to execute the following procedures.

- (1) Before replacing the System board, execute subtest03 “DMI information save” in 3.3 Setting of the hardware configuration in order to save the DMI information from System board to floppy disk.
- (2) After replacing the System board, execute the subtest04 “DMI information recovery” and subtest08 “System configuration display” in 3.3 Setting of the hardware configuration in order to copy the DMI information and system information from the floppy disk.

### 3.2.1 Diagnostics menu (T&D)

After pressing **1** and **Enter** in the startup menu, the following menu appears.

```
TOSHIBA personal computer Common DIAGNOSTICS
Version X.XX (c) copyright TOSHIBA Corp. 20XX
```

```
DIAGNOSTICS MENU :
1 - DIAGNOSTIC TEST
2 - ONLY ONE TEST
3 -
4 - HEAD CLEANING
5 - LOG UTILITIES
6 - RUNNING TEST
7 - FDD UTILITIES
8 - SYSTEM CONFIGURATION
9 - EXIT TO MS-DOS
```

```
↑↓→← : Select items
Enter  : Specify
Esc    : Exit
```

**NOTE:** To exit the *DIAGNOSTIC TEST MENU*, press the **Esc** key. If a test program is in progress, press **Ctrl + Break** to exit the test program. If a test program is in progress, press **Ctrl + C** to stop the test program.

Set the highlight bar to **1**, and press **Enter**. The following *DIAGNOSTIC TEST MENU* will appear:

```
TOSHIBA personal computer Common DIAGNOSTICS
version X.XX (c) copyright TOSHIBA Corp. 20XX
```

```
DIAGNOSTIC TEST MENU :
1 - SYSTEM TEST
2 - MEMORY TEST
3 - KEYBOARD TEST
4 - DISPLAY TEST
5 - FLOPPY DISK TEST
6 - PRINTER TEST
7 - ASYNC TEST
8 - HARD DISK TEST
9 - REAL TIMER TEST
10 - NDP TEST
11 - EXPANSION TEST
12 - CD-ROM/DVD-ROM TEST
88 - ERROR RETRY COUNT SET [FDD & HDD]
99 - EXIT TO DIAGNOSTICS MENU
```

```
↑↓→← : Select items
Enter  : Specify
Esc    : Exit
```

Functions 1 through 12 are the Diagnostic Tests. Function 88 sets the floppy disk drive and hard disk drive error retry count (0-255).

To exit the submenu of the Diagnostic Test and returns to the Diagnostics Menu, set the highlight bar to function 99 and press **Enter**.

Select the option you want to execute and press **Enter**. When you select 1- SYSTEM TEST, the following message will appear:

```

SYSTEM TEST NAME      XXXXXXXX
                        xxxxxxxx DIAGNOSTIC TEST VX.XX
                        [Ctrl]+[Break] : test end
                        [Ctrl]+[C]   : key stop

SUB-TEST      : XX
PASS COUNT   : XXXXX      ERROR COUNT : XXXXX
WRITE DATA  : XX        READ DATA   : XX
ADDRESS     : XXXXXXXX STATUS      : XXX

SUB-TEST MENU :
01 - ROM checksum
02 - Fan ON/OFF
03 - Geyserville
04 - Quick charge
05 - DMI read
99 - Exit to DIAGNOSTIC TEST MENU

                        ↑↓→← : Select items
                        Enter  : Specify
                        Esc    : Exit

```

**NOTE:** The menu displayed by your computer may be slightly different from the one shown above.

Select the desired subtest number from the subtest menu and press **Enter**. The following message will appear:

```

TEST LOOP   : YES (or NO)
ERROR STOP  : YES (or NO)

```

Use the right and left arrow keys to move the cursor to the desired option.

Selecting **YES** of TEST LOOP increases the pass counter by one, each time the test cycle ends and restarts the test cycle.

Selecting **NO** returns the process to the subtest menu after the test is complete.

Use the up and down arrow keys to move the cursor to “ERROR STOP”.

Use the right and left arrow keys to move the cursor to the desired option and press **Enter**.

Selecting **YES** of ERROR STOP stops the test program when an error is found and displays the operation guide on the right side of the display screen as shown below:

```

ERROR STATUS NAME    [[ HALT OPERATION ]]

                                1: Test end
                                2: Continue
                                3: Retry

```

These three selections have the following functions respectively:

1. Terminates the test program and exits to the subtest menu.
2. Continues the test.
3. Restarts the test from the error.

Selecting **NO** keeps the test running even if an error is found. When an error occurred, the error status is displayed and one error is added to the error counter.

Table 3-1 in section 3.5 describes the function of each test on the subtest menu. Table 3-2 in section 3.18 describes the error codes and error status for each error.

### 3.2.2 H/W initial information setting tool

After selecting this test, the following menu appears in the display.

```

#####
#####   H/W initial information setting tool   VX.XX   #####
#####
*      1           Initial configuration                               *
*      3           DMI information save                               *
*      4           DMI information recovery                           *
*      8           System configuration display                       *
*      9           E2PROM test (MAC/GUID/DMI)                         *
*****
... Press test number [1-3,4,8,9] ?

```

For more details on this test, refer to the section 3.3.

### 3.2.3 Heatrun test program

Heatrun test starts executing the same subtest as 3.23 Running Test.

For more details on this test, refer to the section 3.4.

### 3.3 Setting of the hardware configuration

To execute this program, select `2-Repair initial config set` in the startup menu, press **Enter** and follow the directions on the screen. The H/W initial information setting tool consists of four subtests. Move the highlight bar to the subtest you want to execute and press **Enter**.

#### Subtest 01 Initial configuration

This subtest executes the following items and shows their contents in the display. When an item ends normally, the program proceeds automatically to the next one. When an error is found, the program stops and waits for key input. (After solving the problem, the program executes the item again.)

Setting of the CPU set table  
Setting of the microcode  
Setting of the EHSS  
Inputting and writing of DMI information

When the DMI information is displayed, the following messages appear in order. Input each information. (If you do not replace the PCB, the DMI information should not be changed.)

1. “Enter Model Name ?” is displayed. Input the computer’s model name and press **Enter**. (e.g. PORTEGE)
2. “Enter Version Number ?” is displayed. Input the computer’s version number and press **Enter**. (e.g. PC18070C313S)
3. “Enter Serial Number ?” is displayed. Input the computer’s serial number and press **Enter**. (e.g. 12345678)
4. “Enter Model Number ?” is displayed. Input the computer’s sales model number and press **Enter**. (e.g. PP200-AAAAA)
5. “Enter Bundle Number ?” is displayed. Input the computer’s PCN/Bundle number and press **Enter**. (e.g. PMSREQ3Q34H/S0123456789)
6. “Write data OK (Y/N) ?” is displayed. To write the DMI information to the Flash ROM, press **Y**, and then **Enter**.
7. “Create DMIINFO TXT (Y/N) ?” is displayed. Press **Y**, then the DMI information (text data) is written to the Floppy disk, etc.

Setting of the HWSC  
Setting of the UUID  
Display of the DMI information (including UUID)  
Setting of DVD region code (Yes/No)

After completion of the above settings, H/W configuration & DMI information are appeared in order. Check the contents and press **Enter**.

Following message appears in the display. Press any key, then return to the H/W initial information setting tool menu.

```
+-----+  
+ It switches off the power on automatically. +  
+-----+  
Press any key to continue...
```

#### Subtest 03 DMI information save

***NOTE:*** Before replacing the System board, be sure to execute this subtest and save the DMI information to the floppy disk.

This is one of tools to copy the DMI information to a new PCB after replacing.

This subtest saves all the DMI data in a floppy disk.



## Subtest 04 DMI information recovery

- NOTE:** 1. After replacing the System board, be sure to execute this subtest and copy the DMI information to a new System board.
2. Since the data of UUID is updated every time when this subtest, DMI information recovery, is done, the saved UUID data is not written.

This is one of tools to copy the DMI information to a new PCB after replacing.

This subtest writes all the DMI data in the floppy disk into the new PCB.

## Subtest 08 System configuration display

This subtest displays the information of the system configuration.

Confirm the contents and press **Enter**.

For more details on the system configuration information, refer to 3.25 “System configuration”.

## Subtest 09 E2PROM test (MAC/GUID/DMI)

It checks whether the MAC address, GUID of IEEE1394 and DMI information are written.

### 3.4 Heatrun Test

To execute this program, select 3-*Repair* *heatrun* in the startup menu, press **Enter**.

After selecting the test, the same subtests as 3.23 *RUNNING TEST* are executed successively.

For more details on the procedure and test content, refer to *RUNNING TEST*.

When the *heatrun* test ends, following message appears in the display.

```
*****  
HEATRAN TEST END  
*****  
Press any key to continue...
```

Press any key and return to the startup menu.

**NOTE:** *The test result (Errorlog.txt) is stored in the floppy disk. The result is displayed in the same way as 3.22 LOG UTILITIES. For more detail in the display, refer to LOG UTILITIES.*

### 3.5 Subtest Names

Table 3-1 lists the subtest names for each test program in the DIAGNOSTIC TEST MENU.

*Table 3-1 Subtest names (1/2)*

No.	Test Name	Subtest No.	Subtest Name
1	SYSTEM	01	ROM checksum
		02	Fan ON/OFF
		03	Geyserville
		04	Quick charge
		05	DMI read
2	MEMORY	01	Conventional memory
		02	Protected mode
		03	Protected mode (cache off)
		04	Cache memory (on/off)
		05	Stress
3	KEYBOARD	01	Pressed key code display
4	DISPLAY	01	VRAM read/write for VGA
		02	Gradation for VGA
		03	Gradation for LCD
		04	Gradation & Mode test for VGA
		05	All dot on/off for LCD
		06	"H" pattern display
		07	LCD brightness
5	FLOPPY DISK	01	Sequential read
		02	Sequential read/write
		03	Random address/data
		04	Write specified address
		05	Read specified address

Table 3-1 Subtest names (2/2)

No.	Test Name	Subtest No.	Subtest Name
6	PRINTER	01	Ripple pattern
		02	Function
		03	Wraparound
7	ASYNC	01	FIR/SIR point to point (send)
		02	FIR/SIR point to point (receive)
		03	Wrap around (on board)
8	HARD DISK	01	Sequential read
		02	Address uniqueness
		03	Random address/data
		04	Cross talk & peak shift
		05	Partial read
		06	Write specified address
		07	Read specified address
		08	Sequential write
		09	W-R-C specified address
9	REAL TIMER	01	Real time
		02	Backup memory
		03	Real time carry
10	NDP	01	NDP
11	EXPANSION	01	PCMCIA wraparound
		03	RGB monitor ID
12	CD-ROM /DVD-ROM	01	Sequential read
		02	Read specified address
		03	Random address/data
		04	RW 1point W/R/C

## 3.6 System Test

To execute the System Test select **1** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

### Subtest 01 ROM checksum

This subtest executes a checksum test of the BIOS ROM (range: F0000h to FFFFFh, 64KB) on the System board.

### Subtest 02 Fan ON/OFF

This subtest turns on/off the fan motor by force with Fan ON/OFF commands.

The following message will appear.

```
Fan number select (1;FAN#1(CPU), 2;FAN#2(GPU), 0; FAN#1&#2)?
```

To check the CPU fan, press **1** and **Enter**.

To check the GPU fan, press **2** and **Enter**.

To check both CPU fan and GPU fan, press **0** and **Enter**.

The following message will appear.

```
*** Test Fan Revolution 0000RPM start
```

Make sure the fan does not rotate, then press **Enter**.

The following message will appear.

```
*** Test Fan Revolution Low speed Start
```

Make sure the fan rotates at low speed, then press **Enter**.

The following message will appear.

```
*** Test Fan Revolution High speed Start
```

Make sure the fan rotates at high speed, then press **Enter**.

After a while, the fan rotating will stop.

### Subtest 03 Geyserville

If the CPU supports Geyserville (SpeedStep), this Subtest checks that the CPU operating clock speed can be changed.

### Subtest 04 Quick charge

This subtest checks the status for the quick charge.

Subtest 05 DMI read

This subtest displays the information in the Flash-ROM in the following format.

```
*** DMI Data Display Ver X.XX ***  
Model Name       : XXXXXXXXXXXX  
Version Number  : XXXXXXXXXXXX  
Serial Number   : XXXXXXXX  
Model Number    : XXXXXX-XXXXX  
UUID Number     : XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
Press [Enter] to EXIT
```

To exit this subtest and return to the SYSTEM test menu, press **Enter**.

### 3.7 Memory Test

To execute the Memory Test, select **2** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Conventional memory

This subtest writes a constant data to conventional memory (0 to 640 KB), then reads the new data and compares the result with the original data.

Subtest 02 Protected mode

**NOTE:** The CONFIG.SYS file must be configured without expanded memory manager programs such as EMM386.EXE, EMM386.SYS or QEMM386.SYS. Also, the HIMEM.SYS must be deleted from the CONFIG.SYS file.

This subtest writes constant data and address data (from 1MB to maximum MB), and reads the new data and compares the result with the original data.

Subtest 03 Protected mode (cache off)

This subtest executes the same way as the subtest02 with the cache off.

Subtest 04 Cache memory (on/off)

To test the cache memory, a pass-through write-read comparison of '5Ah' data is run repeatedly to the test area ('7000': 'Program size' to '7000': '7FFF' (32 KB)) to check the hit-miss ratio (on/off status) for CPU cache memory. One test takes 3 seconds.

Number of misses < Number of hits → OK

Number of misses ≥ Number of hits → Fail

Subtest 05 Stress

Data (from 1MB to the maximum MB) is written from the 16KB write buffer to the 16KB read buffer and compared the data in the buffers. The read buffer starts from 0001 and the comparison is continued with the following read buffer addresses: 0001, 0003, 0005, 0007, 0009, 000b, 000d and 000f.

### 3.8 Keyboard Test

To execute the Keyboard Test, select **3** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

#### Subtest 01 Pressed key code display

When a key is pressed, the scan code, character code, and key top name are displayed on the screen in the format shown below. The **Ins Lock, Caps Lock, Num Lock, Scroll Lock, Alt, Ctrl, Left Shift,** and **Right Shift** keys are displayed in reverse screen mode when pressed. The scan codes, character codes, and key top names are shown in Appendix D.

```
KEYBOARD TEST  IN PROGRESS  302000
      Scan code      =
      Character code  =
      Keytop         =
Ins Lock  Caps Lock  Num Lock   Scroll Lock
Alt       Ctrl       Left Shift  Right Shift
PRESS [Enter] KEY
```



### 3.9 Display Test

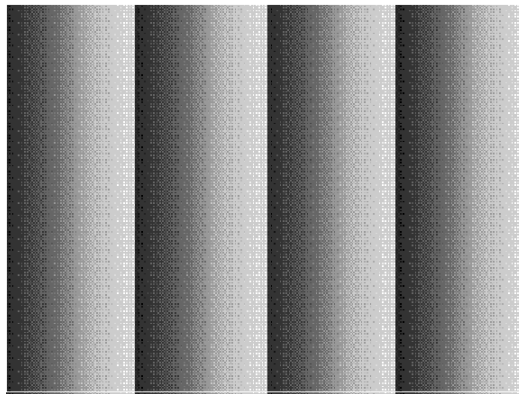
To execute the Display Test, select **4** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 VRAM read/write for VGA

This subtest writes the constant data (AAh and 55h) to the video RAM. The data is read and compared to the original data.

Subtest 02 Gradation for VGA

This subtest displays four colors: red, green, blue and white from left to right across the screen from black to maximum brightness. The display below appears on the screen, when this subtest is executed.



To exit this subtest and return to the DISPLAY TEST menu, press **Enter**.

Subtest 03 Gradation for LCD

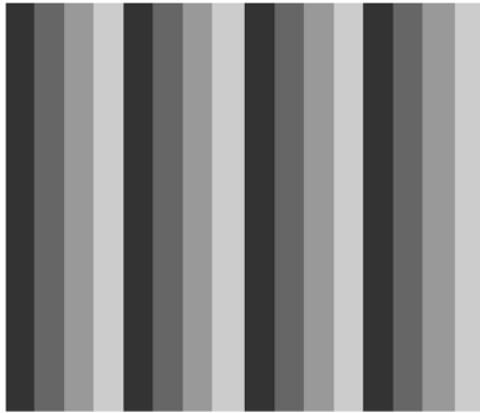
This subtest displays bands of gradations for mixed colors, then for red, green, and blue. Next, it displays eight solid colors full screen: red, semi-red, green, semi-green, blue, semi-blue, white, and semi-white. Each color displays for three seconds.

**Subtest 04 Gradation & Mode test for VGA**

This subtest displays gradations for following modes. To change the mode, press **Enter**.

```
[Mode 12]
[Mode 13]
[Mode 3]
[Mode 111  640*480  64K]
[Mode 112  640*480  16M]
[Mode 114  800*600  64K]
[Mode 115  800*600  16M]
[Mode 117 1024*768  64K]
[Mode 118 1024*768  16M]
```

The display below appears on the screen when this subtest is executed.



[ Mode 12 ]

(Display example: Mode 12)

To exit this subtest and return to the DISPLAY TEST menu, press **Enter** after displaying the Mode 118.

**Subtest 05 All dot on/off for LCD**

This subtest displays an all-white screen then an all-black screen. The display changes automatically every three seconds, then returns to the DISPLAY TEST menu.



### 3.10 Floppy Disk Test

**CAUTION:** Before running the floppy disk test, prepare a formatted work disk. Remove the Diagnostics Disk and insert the work disk into the FDD. The contents of the floppy disk will be erased.

To execute the Floppy Disk Test, select **5** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions displayed on the screen. After selecting the Floppy Disk Test from the DIAGNOSTIC TEST MENU, messages to execute the test drive number, media type and test start truck will be displayed successively. Answer each question with an appropriate response to execute the test.

1. The following message will appear. Select the media mode and start track to be tested, then press **Enter**.

```
Test start track      (Enter:0/dd:00-79) ?
```

2. The Floppy Disk test contains five subtests that test the FDD. The floppy disk test menu will appear after you select FDD test parameters.

```
FLOPPY DISK          XXXXXXXX
```

```
XXX DIAGNOSTIC TEST VX.XX
[Ctrl]+[Break] : test end
[Ctrl]+[C]     : key stop
```

```
SUB-TEST   : XX
PASS COUNT : XXXXX   ERROR COUNT : XXXXX
WRITE DATA : XX     READ DATA  : XX
ADDRESS    : XXXXXXX STATUS      : XXX
```

```
SUB-TEST MENU :
```

```
01 - Sequential read
02 - Sequential read/write
03 - Random address/data
04 - Write specified address
05 - Read specified address
99 - Exit to DIAGNOSTIC TEST MENU
```

```
↑↓→← : Select items
Enter : Specify
Esc   : Exit
```

Select the number of the subtest you want to execute and press **Enter**. The following message will appear during the floppy disk test.

```
FLOPPY DISK  IN PROGRESS  XXXXXXXX  xxx DIAGNOSTIC TEST VX.XX
                                         [Ctrl]+[Break] : test end
                                         [Ctrl]+[C]   : key stop
```

```
SUB-TEST      : XX
PASS COUNT    : XXXXX   ERROR COUNT   : XXXXX
WRITE DATA   : XX      READ DATA    : XX
ADDRESS       : XXXXXXX  STATUS        : XXX
```

When the subtest 04 or 05 is selected, the following messages will appear on the screen. Select the test data (subtest 04 only), track number and head number you want to test.

```
Test data     ?? (subtest 04 only)
Track No.     ??
Head No.      ?
```

**Subtest 01** Sequential read

This subtest performs a Cyclic Redundancy Check (CRC) that continuously reads all the tracks (track: 0 to 39/0 to 79) on a floppy disk.

**Subtest 02** Sequential read/write

This subtest continuously writes data pattern B5ADADh to all the tracks (track: 0 to 39/0 to 79) on a floppy disk. The data is then read and compared to the original data.

**Subtest 03** Random address/data

This subtest writes random data to random addresses on all tracks (track: 0 to 39/0 to 79) on a floppy disk. The data is then read and compared to the original data.

**Subtest 04** Write specified address

This subtest writes the data specified by an operator to a specified track, head, and address.

**Subtest 05** Read specified address

This subtest reads data from a track, head, and address specified by an operator.

## 3.11 Printer Test

**CAUTION:** Printer Test is not supported for this model.

To execute the Printer Test, select **6** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. The following messages will appear after selecting the Printer Test from the DIAGNOSTIC TEST MENU. Answer each of the questions with an appropriate response to execute the test.

**NOTE:** An IBM compatible printer must be connected to the system to execute this test. Also, printer port wraparound connector must be connected.

The following message will appear, after selecting the subtest 01 to 03 of the printer test:

```
channel#1 = XXXXh
channel#2 = XXXXh
channel#3 = XXXXh
```

Select the channel number (1-3) ?

The printer I/O port address is specified by the XXXXh number. The computer supports three printer channels. Select the printer channel number, and press **Enter** to execute the selected subtest.

### Subtest 01 Ripple Pattern

This subtest prints characters for codes 20h through 7Eh line-by-line while shifting one character to the left at the beginning of each new line.

```
:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnop
:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnop
:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopq
r
:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrs
t
:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstu
v
:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstu
vw
:"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstu
vwxy
```

## Subtest 02      Function

This subtest is for IBM compatible printers, and tests the following functions:

Normal print  
 Double-width print  
 Compressed print  
 Emphasized print  
 Double-strike print  
 All characters print

This subtest prints the various print types shown below:

```

PRINTER TEST
1. THIS LINE SHOWS NORMAL PRINT.
2. THIS LINE SHOWS DOUBLE-WIDTH PRINT.
3. THIS LINE SHOWS COMPRESSED PRINT.
4. THIS LINE SHOWS EMPHASIZED PRINT.
5. THIS LINE SHOWS DOUBLE-STRIKE PRINT.
6. ALL CHARACTERS PRINT
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN OPQRSTUVWXYZ[\]^_`abcdefghijklmnop
opqrstuvwxyz{|}~

```

## Subtest 03      Wraparound

**NOTE:** To execute this subtest, a printer wraparound connector must be connected to the computer's printer port.

This subtest checks the output and bi-directional modes of the data control and status lines through the parallel port wraparound connector (34M741986G01). (Both output and bi-directional modes are tested.)

## 3.12 Async Test

To execute the Async Test, select **7** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions displayed on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 and 02 require the following data format:

Method: Asynchronous  
Speed: 38400BPS  
Data: 8 bits and one parity bit (EVEN)  
Data pattern: 20h to 7Eh

Subtest 01 FIR/SIR point to point (send)

**NOTE:** To execute subtests 01 and 02, each computer must have access to the other computer's infrared port.

This subtest sends 20h through 7Eh data to the receive side, then receives the sent data and compares it to the original data through the FIR/SIR port.

Subtest 02 FIR/SIR point to point (receive)

This subtest is used with subtest 01 described above. This subtest receives the data from the send side, then sends the received data through the FIR/SIR port.

Subtest 03 Wraparound (on board)

**NOTE:** To execute this subtest, an RS-232C wraparound connector must be connected to the RS-232C port.

This subtest checks the data send/receive function through the wraparound connector.



### 3.13 Hard Disk Test

To execute the Hard Disk Test, select **8** from the DIAGNOSTIC TEST MENU, press **Enter**, and follow the directions on the screen.

**CAUTION:** *When executing subtest02, 03, 04, 06, 08 and 09, the message [The hard disk will be destroyed.] will be displayed. The contents of the hard disk will be erased when these tests are executed. Before running the test, the customer should transfer the contents of the hard disk to floppy disk or another hard disk. If the customer has not or cannot perform the back-up, create back-up disks as described below.*

*Check to see if the Microsoft Create System Disks Tools (MSCSD.EXE) still exists in the System Tools Folder. (This tool can be used only once.) If it exists, use it to back up the pre-installed software, then use the Backup utility in the System Tools folder to back up the entire disk, including the user's files.*

*Refer to the operating system instructions.*

When a 2nd HDD is installed, the following messages will appear after selecting the hard disk test from the DIAGNOSTIC TEST MENU.

```
Test drive number select      (1:HDD#1, 2:HDD#2, 0:HDD#1&2) ?
```

1. Input the number of HDD test and press **Enter**.
2. This message is used to select the error dump operation when a data compare error is detected. Select **1** or **2**.

```
Data compare error dump (1:no, 2:yes)
```

3. This message is used to select whether or not the HDD status is displayed on the screen. The HDC status is described in section 3.19. Select **1** or **2**.

```
Detail status display      (1:no, 2:yes)
```

4. The Hard Disk Test message will appear after you respond to the Detail Status prompt. Select the number of the subtest you want to execute and press Enter. The following message will appear during each subtest.

```
HARD DISK TEST XXXXXXXX
```

```
XXX DIAGNOSTIC TEST VX.XX
[Ctrl]+[Break] : test end
[Ctrl]+[C]     : key stop
```

```
SUB TEST      : XX
PASS COUNT    : XXXXX      ERROR COUNT    : XXXXX
WRITE DATA   : XX         READ DATA   : XX
ADDRESS       : XXXXXXX    STATUS        : XXX
```

The first three digits of the ADDRESS indicate which cylinder is being tested, the fourth digit indicates the head and the last two digits indicate the sector.

The first digit of the STATUS number indicates the drive being tested and the last two digits indicate the error status code as explained in table 3-2 of the section 3.18.

#### Subtest 01 Sequential read

This subtest is a sequential reading of all the tracks on the HDD starting at track 0. When all the tracks on the HDD have been read, the test starts at the maximum track and reads the tracks on the HDD sequentially back to track 0.

#### Subtest 02 Address uniqueness

This subtest writes unique address data to each sector of the HDD track-by-track. The data written to each sector is then read and compared with the original data. There are three ways the HDD can be read:

1. Forward sequential
2. Reverse sequential
3. Random

#### Subtest 03 Random address/data

This subtest writes random data in a random length to random addresses. This data is then read and compared to the original data.

**Subtest 04** Cross talk & peak shift

This subtest writes eight types of worst pattern data (listed below) to a cylinder, then reads the data while moving from cylinder to cylinder. (Test the data interference in the neighbor track)

<b>Worst pattern data</b>	<b>Cylinder</b>
'B5ADAD'	0 cylinder
'4A5252'	1 cylinder
'EB6DB6'	2 cylinder
'150449'	3 cylinder
'63B63B'	4 cylinder
'9C49C4'	5 cylinder
'2DB6DB'	6 cylinder
'D25044'	7 cylinder

**Subtest 05** Partial read

This subtest reads 1GB data that is in minimum, middle and maximum address of the HDD area.

**Subtest 06** Write specified address

This subtest writes specified data to a specified cylinder and head on the HDD.

**Subtest 07** Read specified address

This subtest reads data, which has been written to a specified cylinder and head on the HDD.

**Subtest 08** Sequential write

This subtest writes specified 2-byte data to all of the cylinders on the HDD.

**Subtest 09** W-R-C specified address

This subtest writes data to a specified cylinder and head on the HDD, then reads the data and compares it to the original data.

## 3.14 Real Timer Test

To execute the Real Timer Test, select **9** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

### Subtest 01 Real time

A new date and time can be input during this subtest. To execute the real time subtest, follow these steps:

1. Select subtest 01 and the following messages will appear:

```
Current date : XX-XX-XXXX
```

```
Current time : XX:XX:XX
```

```
Enter new date:
```

```
PRESS [ENTER] KEY TO EXIT TEST
```

2. If the current date is not correct, input the correct date at the “Enter new date” prompt and press **Enter**.

3. The date is updated and the following messages will appear:

```
Current date : XX-XX-XXXX
```

```
Current time : XX:XX:XX
```

```
Enter new time:
```

```
PRESS [ENTER] KEY TO EXIT TEST
```

4. If the current time is not correct, input the correct time in 24-hour format. To enter “:”, press **Shift + ;**. The time is updated.

To exit the test, press **Enter**.

### Subtest 02 Backup memory

This subtest checks the following backup memories:

Writes 1-bit of “on” data (01h through 80h) to address 0Eh through 7Fh

Writes 1-bit of “off” data (FEh through 7Fh) to address 0Eh through 7Fh

Writes the data pattern AAh and 55h to the address 0Eh to 7Fh

Then the subtest reads and compares this data with the original data.

## Subtest 03 Real time carry

**CAUTION:** *When this subtest is executed, the current date and time are erased.*

This subtest checks the real time clock increments. Make sure the date and time are displayed in the following format:

```
Current date : 12-31-1999
Current time : 23:59:58
```

The real time increments are automatically executed and the following is displayed:

```
Current date : 01-01-2000
Current time : 00:00:00
```

```
PRESS [Enter] KEY TO EXIT TEST
```

To exit the test, press **Enter**.

### 3.15 NDP Test

To execute the NDP test, select **10** from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen.

#### Subtest 01    NDP

This test checks the following functions of NDP:

- Control word
- Status word
- Bus
- Addition
- Multiplication

### 3.16 Expansion Test

To execute the expansion test, select **11** from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen.

Subtest 01 PCMCIA wraparound

**CAUTION:** PCMCIA wraparound test is not supported for this model.

**NOTE:** To execute this subtest, the PC card wraparound connector is required.

This subtest checks the following signal line of the PC card slot:

- Address line
- REG#, CE#1, CE#2 line
- Data line
- Speaker line
- Wait line
- BSY#, BVD1 line

This subtest is executed in the following order:

Sub#	Address	Good	Bad	Contents
01	00001 00001	nn nn	xx xx	Address line REG#, CE#1, CE#2 nn=A0, 90, 80, 00
02	00002	ww	rr	Data line ww=write data, rr=read data
03	00003	—	—	Speaker line
04	00004	40,80	xx	Wait line (40<xx<80)
05	00005	nn	xx	Other lines (BSY#, BVD1) NN=21, 00

**NOTE:** When selecting the subtest number 01, the following message will appear:  
Test slot number select (1:slot0, 2:slot1, 0:slot0&1)?

## Subtest 02 RGB monitor ID

**NOTE:** To execute this subtest, an external monitor with monitor ID function is required.

Connect the external monitor to the PC for the test of ID acquisition.

The judgment of acquisition is based on the panel data. In simultaneous display mode or internal display mode, in which the panel data is acquired, this subtest will fail. Therefore, make sure only the external display is selected when executing this subtest.



### 3.17 CD-ROM/DVD-ROM Test

To execute the CD-ROM/DVD-ROM test, select **12** from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen.

**NOTE:** For the subtest 01, 02 and 03, use the TOSHIBA CD-ROM TEST DISK TDY-01 or ABEX TEST CD-ROM TCDR-702 and DVD-ROM TEST DISK TSD-1. For the subtest 04, use a CD-RW media on the market.

Subtest 01      Sequential read

This subtest is a sequential reading of one-block units (2K bytes) of all the logical addresses.

Subtest 02      Read specified address

This subtest reads one-block data from a specified address.

Subtest 03      Random address/data

This subtest reads one-block data and multi-block data from random addresses 200 times.

Subtest 04      RW 1point W/R/C

This subtest writes, reads and compares data at one point on a CD-RW media.

### 3.18 Error Code and Error Status Names

Table 3-2 lists the error codes and error status names for the Diagnostic Test.

*Table 3-2 Error codes and error status names (1/3)*

Device name	Error code	Error status name
Common	FF	Data Compare Error
System	01 03 04 05 06 07 08 09 10	ROM - CHECKSUM ERROR ROM - SERIAL ID WRITE ERROR ROM - NOT SUPPORTED PS-SYSTEM ROM - SENSING ERROR(AC-ADAPT) ROM - SENSING ERROR(1st Batt) ROM - SENSING ERROR(2nd Batt) ROM - THORMISTOR ERROR(1) ROM - THORMISTOR ERROR(2) ROM - THORMISTOR ERROR(3)
Memory	01 02 DD	RAM - PARITY ERROR RAM - PROTECTED MODE NO CHANGE RAM - CACHE MEMORY ERROR
Keyboard	FE FD F0 F1 F2 F3 F4 F5 F6 F7 F8 F9 FA EF ED	USB - GET DESCR.ERROR (FIRST) USB - SET ADDRESS ERROR HUB - GET DESCR.ERROR(Top 8B) HUB - GET DESCR.ERROR (Whole) HUB - SET CONFIGURATION ERROR HUB - GET DESCR.ERROR(DESCR.) HUB - SET FEATURE ERROR(P ON) HUB - GET STATUS ERROR HUB - SET FEATURE ERROR(RESET) HUB - CLEAR FEATURE ERROR HUB - CLEAR FEATURE1 ERROR HUB - SET FEATURE ERROR(Enab.) HUB - CLEAR FEATURE2 ERROR USB - OVER CURRENT ERROR USB - GET DESCR.ERROR(SECOND)
Display	EE	VRAM SIZE NOT SUPPORT

Table 3-2 Error codes and error status names (2/3)

Device name	Error code	Error status name
FDD	01 02 03 04 08 09 10 20 40 80 60 06 EE	FDD - BAD COMMAND ERROR FDD - ADDRESS MARK NOT FOUND FDD - WRITE PROTECTED FDD - RECORD NOT FOUND FDD - DMA OVERRUN ERROR FDD - DMA BOUNDARY ERROR FDD - CRC ERROR FDD - FDC ERROR FDD - SEEK ERROR FDD - TIME OUT ERROR FDD - NOT DRIVE ERROR FDD - MEDIA REMOVED FDD - WRITE BUFFER ERROR
Printer	01 08 10 20 40 80	PRT - TIME OUT PRT - FAULT PRT - SELECT LINE PRT - OUT OF PAPER PRT - POWER OFF PRT - BUSY LINE
ASYNC	01 02 04 08 10 20 40 80 88 05 06	RS232C - [DTR ON] TIME OUT RS232C - [CTS ON] TIME OUT RS232C - [RX READY] TIME OUT RS232C - [TX FULL] TIME OUT RS232C - PARITY ERROR RS232C - FRAMING ERROR RS232C - OVERRUN ERROR RS232C - LINE STATUS ERROR RS232C - MODEM STATUS ERROR SIR - TIME OUT ERROR FIR - TIME OUT ERROR
HDD	05 07 09 0B BB 08 01 02 04 10 20 40 80 11 AA	HDD - HDC NOT RESET ERROR HDD - DRIVE NOT INITIALIZE HDD - DMA BOUNDARY ERROR HDD - BAD TRACK ERROR HDD - UNDEFINED ERROR HDD - OVERRUN ERROR (DRQ ON) HDD - BAD COMMAND ERROR HDD - ADDRESS MARK NOT FOUND HDD - RECORD NOT FOUND ERROR HDD - ECC ERROR HDD - HDC ERROR HDD - SEEK ERROR HDD - TIME OUT ERROR HDD - ECC RECOVER ENABLE HDD - DRIVE NOT READY

Table 3-2 Error codes and error status names (3/3)

Device name	Error code	Error status name
(HDD)	CC E0 0A EE DA 12	HDD - WRITE FAULT HDD - STATUS ERROR HDD - BAD SECTOR HDD - ACCESS TIME ERROR HDD - NO HDD HDD - DMA CRC ERROR
NDP	01 02 03 04 05 06	NDP - NO CO-PROCESSOR NDP - CONTROL WORD ERROR NDP - STATUS WORD ERROR NDP - BUS ERROR NDP - ADDITION ERROR NDP - MULTIPLAY ERROR
EXPANSION	C1 C3 C4 C5 C6 C7 C8 CB CC CE CF	ADDRESS LINE ERROR CE#1 LINE ERROR CE#2 LINE ERROR DATA LINE ERROR WAIT LINE ERROR BSY# LINE ERROR BVD1 LINE ERROR ZV-Port ERROR NO PCMCIA CARD TYPE ERROR ZV-CONT# ERROR
CD-ROM /DVD-ROM	01 02 03 04 05 06 09 11 20 40 80 90 B0	BAD COMMAND ILLEGAL LENGTH UNIT ATTENTION MEDIA CHANGE REQUEST MEDIA DETECTED ADDITIMAL SENSE BOUNDARY ERROR CORRECTED DATA ERROR DRIVE NOT READY SEEK ERROR TIME OUT RESET ERROR ADDRESS ERROR

### 3.19 Hard Disk Test Detail Status

When an error occurs in the hard disk test, the following message is displayed:

```
HDC status = XXXXXXXX
```

Detailed information about the hard disk test error is displayed on the screen by an eight-digit number. The first four digits represent the hard disk controller (HDC) error status number and the last four digits are not used.

The hard disk controller error status is composed of two bytes; the first byte displays the contents of the HDC status register in hexadecimal form and the second byte displays the HDC error register.

The contents of the HDC status register and error register are listed in Tables 3-3 and 3-4.

*Table 3-3 HDC status register contents*

Bit	Name	Description
7	BSY (Busy)	"0" ... HDC is ready. "1" ... HDC is busy.
6	DRY (Drive ready)	"0" ... Hard disk drive is not ready to accept any command. "1" ... Hard disk drive is ready.
5	DWF (Drive write fault)	"0" ... DWF error is not detected. "1" ... Write fault condition occurred.
4	DSC (Drive seek complete)	"0" ... The hard disk drive heads are not settled over a track. "1" ... The hard disk drive heads are settled over a track.
3	DRQ (Data request)	"0" ... Drive is not ready for data transfer. "1" ... Drive is ready for data transfer.
2	COR (Corrected data)	"0" ... Not used "1" ... Correctable data error is corrected.
1	IDX (Index)	"0" ... Not used "1" ... Index is sensed.
0	ERR (Error)	"0" ... Normal "1" ... The previous command was terminated with an error.

Table 3-4 Error register contents

Bit	Name	Description
7	BBK (Bad block mark)	"0" ... Not used "1" ... A bad block mark is detected.
6	UNC (Uncorrectable)	"0" ... There is no uncorrectable data error. "1" ... Uncorrectable data error has been detected.
5	—	Not used
4	IDN (Identification)	"0" ... Not used "1" ... There is no ID field in the requested sector.
3	—	Not used
2	ABT (Abort)	"0" ... Not used "1" ... Illegal command error or command abort.
1	TK0 (Track 0)	"0" ... The hard disk found track 0 during a recalibrate command. "1" ... The hard disk could not find track 0 during a recalibrate command.
0	—	Not used

## 3.20 Only One Test

### 3.20.1 Program Description

This program tests the unique functions of this model.

### 3.20.2 Operations

Select test **2** from the DIAGNOSTIC MENU and press **Enter**. The following menu appears in the display.

```
#####
#####          Only One Test Menu (XXXXXXXX)          #####
#####
*
*      1          Pressed Key Display          *
*      2          Touch Pad          *
*      3          Kill Switch          *
*      4          USB          *
*      5          LED          *
*      6          Acceleration sensor          *
*      7          Button          *
*
*      9          Common Test          *
*
*****
.... Press test number[1-7, 9]
```

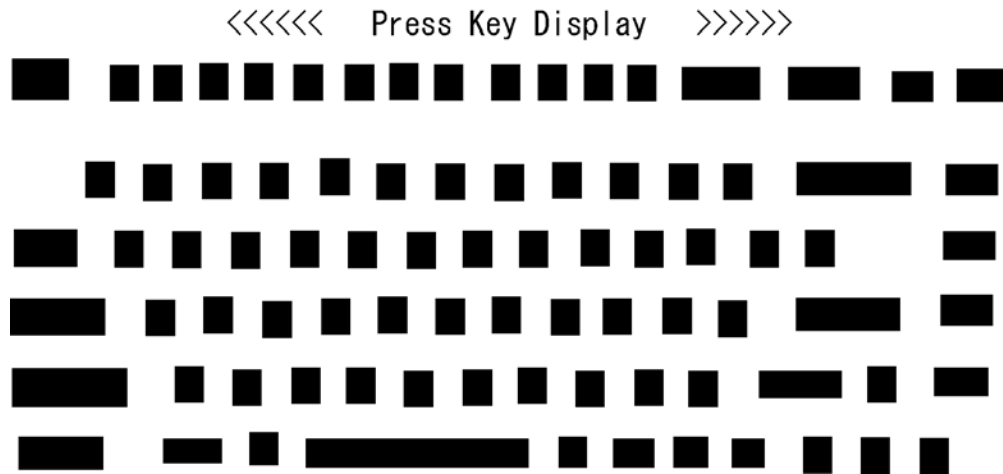
Input the subtest number you want to test and press **Enter**.

To return to the DIAGNOSTIC TEST menu, select **9** and press **Enter**.

## ubtest 01      Pressed key display

When you execute this subtest, the keyboard layout is drawn on the display as shown below. When any key is pressed, the corresponding key on the screen changes to the key character that was pressed. Holding a key down enables the auto-repeat function which causes the key's display character to blink.

Press **Del + Enter** to end the test.



IF TEST OK, Press [Del][Enter]key



Subtest 02 Touch Pad/IPS


This subtest checks the functions of the pointing stick as shown below.

- A) Touch Pad/IPS stick pressure sensing direction and parameter.
- B) Touch Pad/IPS switch function check.

This test reports the pointing stick motion response from the IPS and IPS switch. When the stick is pressed towards the upper left, the <DIRECTION> display changes according to the following illustration. If an IPS switch is pressed, the <LAT> displays appear on the right side one by one. The parameters appear on the center of the display. To exit this subtest, press the four IPS switches at the same time.


```

***** IPS (4-Button) TEST (Vx. xx) *****
< DIRECTION >      < PARAMETER > <LAT>
                    STATUS:0000
                    X-RATE:0000
                    Y-RATE:0000
                    Z-RATE:0000
                    < BUTTONS >
                    <           >
                    <           >
<< Press Bt1+Bt2+UP+DW (Lat) Then exit>>
    
```



```

***** IPS (4-Button) TEST (Vx. xx) *****
< DIRECTION >      < PARAMETER > <LAT>
                    STATUS:0018  Bt nUP
                    X-RATE:00FF   Bt nDW
                    Y-RATE:0001   Bt n-1
                    Z-RATE:0000   Bt n-2
                    < BUTTONS >
                    [BtUP]      [BtDW]
                    < [Button1-ON] >
                    < [Bt2-ON]   >
<< Press Bt1+Bt2+UP+DW (Lat) Then exit>>
    
```



**Subtest 03 Kill Switch**

This subtest checks if the Wireless communication switch works properly.

If the test is started with the switch ON, the following message appears in the display.

```
Kill switch is set to a start position (OFF)
```

Slide the switch to OFF position. Then, the following message appears in the display.

```
KILL SWITCH ON !!
```

Slide the switch to ON position. Then, the following message appears in the display.

```
KILL SWITCH OFF !!
```

After Sliding the switch to OFF position, the screen returns to the Only One Test menu automatically.

**Subtest 04 USB**

**NOTE:** When executing this subtest, USB test module and USB cable must be connected.

This subtest checks if USB ports work properly.

The following menu appears in the display.

```
#####
#####          USB Port Select (XXXXXXXX)          #####
#####
*
* 0          Port 0 (Back)          *
* 1          Port 1 (Left side back)  *
* 2          Port 2 (Left side front) *
*
* 9          EXIT to Only One Menu   *
*
*****
.... Press test number[0-2, 9] ?
```

Connect the USB test module and USB cable to the computer.

Input the test port number and press **Enter**.

**OK** message appears in the display if the test ends without an error.

**NG** message appears in the display if an error is found during the test. Confirm the connection of cable, and then execute the test again.

Press **9** and **Enter** to return to Only One Test menu.

Subtest 05 LED

This subtest checks if each LED lights properly.

The following message appears in the display in order. Follow the instructions in the display to execute the test.

[HDD Access LED test]

Confirm the LED of HDD status blinks properly.

Press any key and following message appears in the display.

[Caps/Num/Overlay BT/W-LAN LED test]

(1) Press [Caps Lock ] key ! ...Caps (on/off)

(2) Press [Fn + F10 ] key ! ...Arrow (on/off)

(3) Press [Fn + F11 ] key ! ...Num (on/off)

(4) Slide [BT/W-LAN switch L&R]! (on/off)

Confirm corresponding LED lights properly.

Press **Enter** and following message appears in the display.

Check [DC-IN]&[Power]&[Main Battery] LED= Green/Orange

Check if the each LED lights in the same color shown in the display (Message switches Green <-> Orange).

Press **Enter** to return to the Only One Test menu.

## Subtest 06 Acceleration sensor

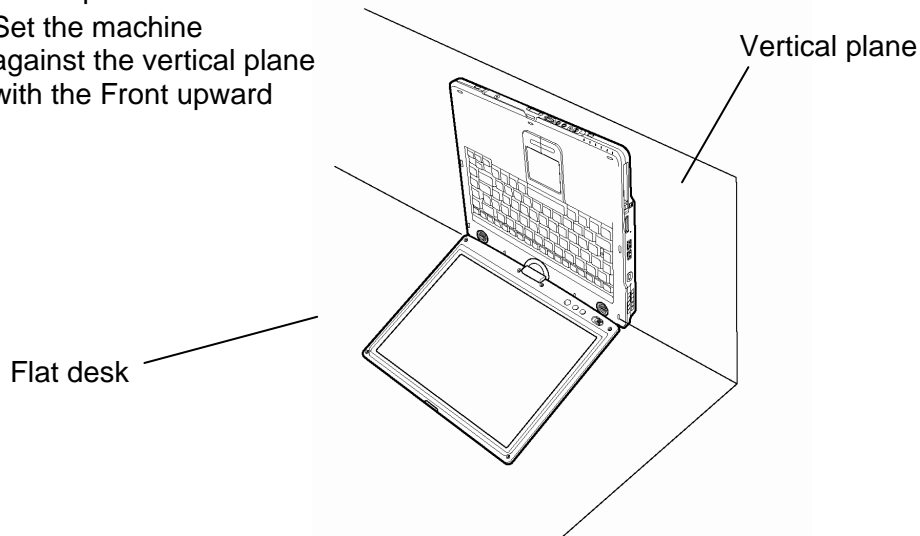
This subtest detects and corrects the each axis (X, Y, Z).

**NOTE:** Make sure that this subtest is executed on the following condition:

1. Flat desk with vertical plane to get the stability of machine.
2. Prevent the machine from shake or shock.

<Example>

Set the machine  
against the vertical plane  
with the Front upward



The figure below shows the name and position of each side.

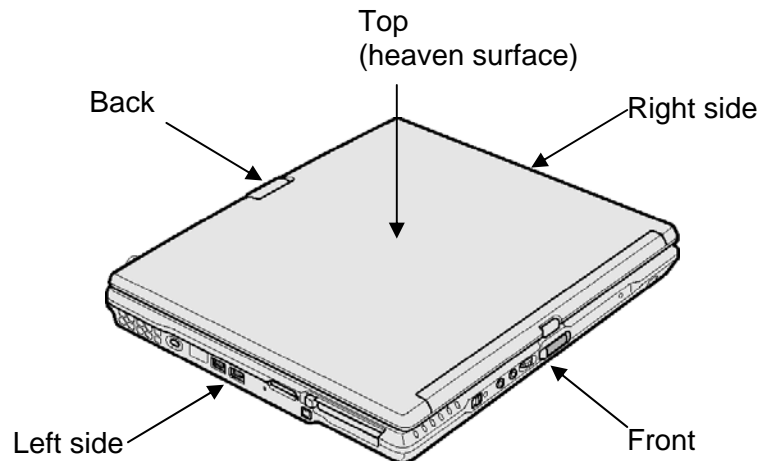


Figure 3-1 Name and positions of each side

When this subtest is selected, the following message appears in the display.

The heaven surface establishes in the upper direction  
Press [Enter] key

**NOTE:** Be sure to execute the test with the display panel opened.

Set the machine on the flat desk. Then press **Enter** to detect the data on this setting of machine. The following message appears in the display.

The back establishes in the upper direction  
Press [Enter] key

Set the machine against the vertical plane on the flat desk with the back of machine upward. Then press **Enter** to detect the data on this setting of machine. The following message appears in the display.

The right establishes in the upper direction  
Press [Enter] key

Set the machine against the vertical plane on the flat desk with the right side of machine upward. Then press **Enter** to detect the data on this setting of machine. The following message appears in the display.

The front establishes in the upper direction  
Press [Enter] key

Set the machine against the vertical plane on the flat desk with the front of machine upward. Then press **Enter** to detect the data on this setting of machine. The following message appears in the display.

The left establishes in the upper direction  
Press [Enter] key

Set the machine against the vertical plane on the flat desk with the left side of machine upward. Then press **Enter** to detect the data on this setting of machine.

When there is no defective during the all checks above, the following message appears in the display. Then press **Enter** and return to the Only One Test menu.

\*\* Setting OK! \*\*  
Press [Enter] key

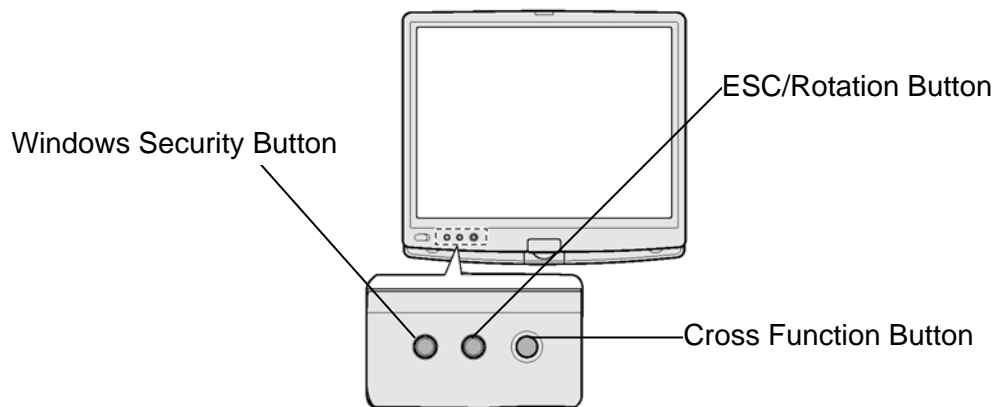
When a defective is found during the each check above, the following message appears in the display. The test is halted at the point when the defective is found.

```
** Setting ERROR! **  
Press [Enter] key
```

Press **Enter** and return to the Only One Test menu. Then execute the test again.

#### Subtest 07 Button

This subtest checks if the buttons in the following figure work properly.



The following message appears in the display.

```
Press [Windows Security Button] key
```

Press Windows security button. Then the following message appears in the display.

```
Press [Escape/Rotation Button] key
```

Press Escape/Rotation button. Then the following message appears in the display.

```
Press [Cross Function Button] key
```

Press Cross Function button. If the test ends successfully, the screen returns to the ONLY ONE TEST menu automatically.

## 3.21 Head Cleaning

### 3.21.1 Function Description

This function cleans the heads in the FDD by executing a series of head load/seek and read operations. A cleaning kit is necessary to perform this program.

### 3.21.2 Operations

1. Selecting test **4** from the DIAGNOSTIC MENU and pressing **Enter** displays the following messages:

```
DIAGNOSTICS - FLOPPY DISK HEAD CLEANING : VX.XX  
Mount cleaning disk(s) on drive(s).  
Press any key when ready.
```

2. Remove the Diagnostics Disk from the FDD, then insert the cleaning disk and press **Enter**.
3. When the "cleaning start" message appears, the FDD head cleaning has begun.
4. The display automatically returns to the DIAGNOSTIC MENU when the program is completed.

## 3.22 Log Utilities

### 3.22.1 Function Description

This function logs error information generated while a test is in progress and stores the results in RAM. This function can store data on a floppy disk, or output the data to a printer or the display.

The error information is displayed in the following order:

1. Error count (CNT)
2. Test name, Subtest number (TS-No)
3. Pass count (PASS)
4. Error status (STS)
5. FDD/HDD or memory address (ADDR)
6. Write data (WD)
7. Read data (RD)
8. HDC status (HSTS)
9. Error status name (ERROR STATUS NAME)

If the power switch is turned off, the error information will be lost.





## 3.23 Running Test

### 3.23.1 Function Description

This function automatically executes the following tests in sequence:

1. System test (subtest 01)
2. Memory test (subtests 01, 02, 06)
3. Display test (subtest 01)
4. Real timer test (subtest 02)
5. HDD test (subtests 01)

The system automatically detects the number of floppy disk drives connected to the computer for the FDD test.

### 3.23.2 Operations

1. Select **6** from the DIAGNOSTIC MENU and press **Enter**, the following messages for selectable tests will appear in the display in order.

```
FDD write/read test (Y/N)?  
Printer wrap around test (Y/N)?  
Serial wrap around test (Y/N)?  
CD-ROM/DVD-ROM test (Y/N)?
```

2. To execute the test, press **Y** and **Enter**. To cancel the test, press **N** and **Enter**. If you select the selectable tests, follow the instruction message in the display.
3. After selecting the selectable tests, the running test starts automatically. To terminate the program, press **Ctrl + Break**.

## 3.24 Floppy Disk Drive Utilities

### 3.24.1 Function Description

This function formats the FDD, copies the floppy disk and displays the dump list for both the FDD and HDD.

#### 1. FORMAT

**NOTE:** *This program is only for testing a floppy disk drive. It is different from the Toshiba MS-DOS FORMAT command.*

This program can format a floppy disk in the following formats:

- (a) 2DD: Double-sided, double-density, double-track, 96/135 TPI, MFM mode, 512 bytes, 9 sectors/track.
- (b) 2HD: Double-sided, high-density, double-track, 96/135 TPI, MFM mode, 512 bytes, 18 sectors/track.

#### 2. COPY

This program copies data from a source floppy disk to a target floppy disk.

#### 3. DUMP

This program displays the contents of the floppy disk and the designated sectors of the hard disk on the display.

#### 4. HDD ID READ

This program reads the hard disk ID and displays hard disk model number.

### 3.24.2 Operations

1. Selecting **7** from the DIAGNOSTIC MENU and pressing **Enter** displays the following message:

```
[ FDD UTILITIES ]

1 - FORMAT
2 - COPY
3 - DUMP
4 - HDD-ID READ
9 - EXIT TO DIAGNOSTICS MENU
```

2. FORMAT program

- (a) Selecting FORMAT displays the following message:

```
DIAGNOSTICS - FLOPPY DISK FORMAT : VX.XX
Drive number select (1:A, 2:B) ?
```

- (b) Select a drive number to display the following message:

```
Type select (0:2DD, 3:2HD) ?
```

- (c) Select a media/drive type number and press **Enter**. A message similar to the one below will be displayed:

```
Warning : Disk data will be destroyed.
Insert work disk into drive A:
Press any key when ready.
```

- (d) Remove the Diagnostics Disk from the FDD, insert the work disk and press any key.

The following message will be displayed when the FDD format is executed:

```
[ FDD TYPE ] : TRACK   = XXX
[ FDD TYPE ] : HEAD    = X
[ FDD TYPE ] : SECTOR  = XX

Format start

[[track, head = XXX X]]
```

After the floppy disk is formatted, the following message will appear:

```
Format complete
Another format (1:Yes/2:No) ?
```

- (e) Typing **1** displays the message from step (c) above. Typing **2** returns the test to the DIAGNOSTIC MENU.

### 3. COPY program

- (a) When COPY is selected, the following message appears:

```
FLOPPY DISK FORMAT & COPY : VX.XX
Type select (0:2DD,3:2HD) ?
```

- (b) Selecting a media/drive type number will display a message similar to the one below:

```
Insert source disk into drive A:
Press any key when ready.
```

- (c) Remove the Diagnostics Disk from the FDD, insert the source disk and press any key. The following message will appear, indicating the program has started.

```
[ FDD TYPE ] : TRACK      = XXX
[ FDD TYPE ] : HEAD       = X
[ FDD TYPE ] : SECTOR     = XX

Copy start
                [[ track,head = XXX X ]]
```

- (d) The following message will appear.

```
Insert target disk into drive A:
Press any key when ready.
```

- (e) Remove the source disk from the FDD, then insert a formatted work disk and press any key. The following message will appear and start copying to the target disk.

```
                [[ track,head = XXX X ]]
```

- (f) When the amount of data is too large to be copied in one operation, the message from step (b) is displayed again. After the floppy disk has been copied, the following message will appear:

```
Copy complete
Another copy (1:Yes/2:No) ?
```

- (g) To copy another disk, type **1** and the message from step (a) is displayed again. Entering **2** returns the test program to the DIAGNOSTIC MENU.

## 4. DUMP program

- (a) When DUMP is selected, the following message appears:

```
DIAGNOSTICS-HARD DISK & FLOPPY DISK DUMP : VX.XX
Drive type select (1:FDD, 2:HDD) ?
```

- (b) Select a drive type. If 2:HDD is selected, the display will go to step (h). If 1:FDD is selected, the following message will appear:

```
Select drive number (1:A, 2:B) ?
```

- (c) Select a drive number and the following message will be displayed.

```
Format type select (1:2DD, 3:2HD) ?
```

- (d) If 3:2HD is selected, the following message will appear. Select a media mode.

```
2HD media mode (1:1.20MB, 2:1.44MB, 3:1.23MB)?
```

- (e) The following message will appear:

```
Insert source disk into drive A:
Press any key when ready.
```

- (f) Insert a source disk and press any key and the following message will appear:

```
— Max. address —
[Track ] = XXXX
[Head  ] = XX
[Sector] = XX
Track number ?????
```

- (g) Set the track number, head number and sector number you want to dump. The system will access the disk and dump a list. Then the message shown in (k) will appear.

- (h) The following message will appear when selecting 2:HDD in (a).

```
Select drive number (1:C, 2:D) ?
```

- (i) Select a drive number and the following message will be displayed.

```
---Max. address ---
[LBA ] = XXXXXXXXXXXX
LBA number ??????????
```

- (j) Set the LBA number you want to dump. The system will access the disk and dump a list.

- (k) The following message will appear. To finish the dump, select **3**.

Press number key (1:up,2:down,3:end) ?

- (l) The following message will appear. Selecting **2** returns to the FDD UTILITIES MENU.

Another dump (1:Yes,2:No) ?

#### 5. HDD ID READ program

Selecting HDD ID displays the following HDD ID configuration:

```
[HDD ID Read (VX.XX)] [Drive #1]    [Drive #2]
Model No.                = XXXXXXXX    = YYYYYYYY
```

Press **Enter** to return to the FDD UTILITIES MENU.

## 3.25 System Configuration

### 3.25.1 Function Description

The System Configuration program contains the following configuration information for the computer:

1. Processor Type [Code/L2 cache]
2. Chip set [VRAM]
3. BIOS ROM version [1st ID, 2nd ID]
4. Boot ROM version
5. EC/KBC version
6. PS Microprocessor version
7. SVP parameter version [Panel/Manufacture code/Product code]
8. Microcode revision [Processor number]
9. Total Memory Size [Conventional memory]
10. Battery code
11. HWSC
12. FSB [Voltage]
13. The number of printer ports
14. The number of ASYNC ports
15. Math co-processors
16. Floppy Disk Drive [Track/Head/Sector]
17. Hard Disk Drive [Sector/Drive size/Manufacture code]
18. Optical Disk Drive [Maker/Drive type/Manufacture code/Product code]
19. T&D total version
20. Date/Time



### 3.25.2 Operations

Select **8** from the DIAGNOSTIC MENU and press **Enter**. Then, the following system configuration appears in the display.

```
System Configuration Display : Ver X.XX [Machine Name ???]

* - Processor Type      = XXXXXX-XXXXXMHz      Code = XX      L2 Cache = XXXXXKB
* - Chip set           = XXXXXX                VRAM = XXXXXMB
* - BIOS ROM Version   = VX.XX      1st ID = XXH, 2nd ID = XXH
* - BOOT ROM Version   = VX.XX
* - EC/KBC Version     = VX.XX
* - PS Micom Version   = VX.XX
* - SVP Par. Version   = VX.XX      (Panel=XXXXXXXX, Manu=XXXX, Prod=XXXX)
* - Microcode Revision = VX.XX      (Processor=XXXh)
* - Total Memory Size  = XXXXXMB (Conventional Memory = XXXKB)
* - Battery Code       = XXXXXXXXXXXX
* - HWSC               = XXXXXXXX
* - FSB                = XXXXXMHz (Voltage = XEh)
* - X Printer Adapter  LPT1 = XXXX LPT2 = XXXX LPT3 = XXXX
* - X ASYNC Adapter    COM1 = XXXX COM2 = XXXX COM3 = XXXX
* - X Math CO-Processor
* - X Floppy Disk Drive(s) Track = XX Head = XX, Sector = XX
* - X Hard Disk Drive(s) #1 Sectors = XXXXXXXXXXX (XXXGB) [XXXXXXXXXXXXXXXXXXXX]
                       #2 Sectors = XXXXXXXXXXX (XXXGB) [XXXXXXXXXXXXXXXXXXXX]
* - ODD Drive          = XXXX XXXXXXXX XXXXXXXX [XXXXXXXXXXXXXXXX]

* - T&D Total Version  = VX.XX

Press [Enter] Key      [Date = XXXX-YY-ZZ, XX:YY:ZZ]
```

Press **Enter** to return to the DIAGNOSTIC MENU.

### 3.26 Wireless LAN Test Program (Intel-made b/g)

This section describes how to perform the wireless LAN transmitting-receiving test (Intel-made Calexico 802.11b/g). To execute the wireless LAN test, use the Diagnostics disk for wireless LAN test. Finish the tests of the Main test program by selecting 99 - EXIT TO DIAGNOSTICS MENU in the DIAGNOSTIC TEST MENU. Then in the DIAGNOSTICS MENU, select 9 - EXIT TO MS-DOS.

Insert the Diagnostics disk for wireless LAN test into the Floppy Disk Drive. Turn on the power while pressing **U**.

The following menu appears in the display.

```
*****Intel Calexico 11b/g Card Maintenance test Menu*****
*
*   1 : SKU check of Module
*
*   2 : MAC Address Check
*
*   3 : Antenna Check & communication test of 11b mode
*
*   4 : Communication test of 11g mode
*
*   5 : All the tests of Calexico 11g Card
*       (SKU & MAC Check, 11b/g communication test)
*
*****
```

SELECT TEST No, (1-5) :

To execute the subtest, input the subtest number and press **Enter**.

Subtest01      SKU check of Module

This subtest displays SKU information on the wireless LAN card installed. Selecting this subtest, following message will appear in the display. Confirm if the right information on the wireless LAN card is described.

```
*****
*
*   Module   : Intel Calexico 802.11b/g (MoW)
*   G-code   : G36C0000X310
*   PBA No.  : C55369
*
*****
```

If a defective is found during the test, **NG** message will appear in the display.

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- Connection of wireless LAN card
- Using a wrong wireless LAN card (Using unspecified card)
- Defective wireless LAN card

Checking the connection, execute the subtest again.

#### Subtest02 MAC Address Check

This subtest displays the MAC address. Selecting this subtest, following message will appear in the display.

```
*****
MAC = XXXXXXXXXXXX
*****
*****
*
*   MAC Address Check : OK !!
*
*****
```

Press any key and return to the test menu.

If a defective is found during the test, following message will appear in the display.

```
*****
ERROR: MAC all 0
MAC = XXXXXXXXXXXX
*****
*****
*
*   MAC Address Check : NG !!
*
*****
```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- Connection of wireless LAN card
- Defective wireless LAN card
- Disappearance of MAC address data

Checking the connection, execute the subtest again.

## Subtest03      Antenna check &amp; communication test of 11b mode

**Caution:** To execute subtest 03-05, use another computer (with Callexico wireless LAN card) that can communicate by the wireless LAN as a responder machine to perform those tests. Access points are also required. (Access point for 802.11b and 802.11g)

Be sure to turn the wireless communication switch ON before executing wireless LAN communication test. (The wireless communication LED lights orange.)

Release the write-protection of floppy disk for the test.

**Setting the responder machine**

Connect the responder machine to the access points (for 802.11b and 802.11g) with a cross cable and turn on the access points.

Insert the floppy disk containing the wireless LAN test program into the FDD of the responder machine and turn on the responder machine.

This subtest checks the connection and communication of wireless LAN antenna of Callexico 802.11b mode.

After finishing the test, **OK** message will appear in the display. Press any key and return to the test menu.

When a defective is found during the test, **NG** message will appear in the display. Press any key and following message will appear in the display. Check which antenna (Main/Aux) is defective.

```
*****
*
*           Main Antenna Test : NG !!
*
*****
```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- Connection of wireless LAN card
- Connection of wireless LAN antenna cable (Main/Aux)
- Condition of wireless LAN communication (Interference/obstruction)
- Defective wireless LAN card

Checking the connection and condition, execute the subtest again.

Subtest04      Communication test of 11g mode

This subtest checks the communication of wireless LAN antenna of Calexico 802.11g mode.

After finishing the test, **OK** message will appear in the display. Press any key and return to the test menu.

When a defective is found during the test, **NG** message will appear in the display. Press any key and following message will appear in the display.

```

*****
*
*           11g Communication Test : NG !!
*
*****

```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- Connection of wireless LAN card
- Connection of wireless LAN antenna cable (Main)
- Condition of wireless LAN communication (Interference/obstruction)
- Defective wireless LAN card

Checking the connection and condition, execute the subtest again.

Subtest05      All the tests of Calexico 11g Card

This subtest checks SKU information, MAC address, connection and communication of wireless LAN antenna of Calexico 802.11b/g card. The test stops at when a defective is found. For more details, refer to each subtest.

### 3.27 Wireless LAN Test Program (Intel-made a/b/g)

This section describes how to perform the wireless LAN transmitting-receiving test (Intel-made Calexico 802.11a/b/g). To execute the wireless LAN test, use the Diagnostics disk for wireless LAN test. Finish the tests of the Main test program by selecting 99 - EXIT TO DIAGNOSTICS MENU in the DIAGNOSTIC TEST MENU. Then in the DIAGNOSTICS MENU, select 9 - EXIT TO MS-DOS.

Insert the Diagnostics disk for wireless LAN test into the Floppy Disk Drive. Turn on the power while pressing **U**.

The following menu appears in the display.

```
*****
*      Intel Calexico2 11a/g Maintenance T&D Menu      *
*
*      1 : SKU check of Module                          *
*
*      2 : MAC Address Check                            *
*
*      3 : Antenna Check & communication test of 11b mode *
*
*      4 : Communication test of 11a mode                *
*
*      5 : Communication test of 11g mode                *
*
*      6 : All the tests of Calexico2 11a/g Card         *
*      (SKU & MAC Check, 11a/b/g communication test)    *
*
*****
```

SELECT TEST No, (1-6) :

To execute the subtest, input the subtest number and press **Enter**.

Subtest01      SKU check of Module

This subtest displays SKU information on the wireless LAN card installed. Selecting this subtest, following message will appear in the display. Confirm if the right information on the wireless LAN card is described.

```
*****
*
*      Module   : Intel Calexico 802.11a/g (MoW)      *
*      G-code   : G36C00018510                       *
*      PBA No.  : C67287                              *
*
*****
```

Press any key and return to the test menu.

If a defective is found during the test, **NG** message will appear in the display.

Press any key and following message will appear in the display.

```

*****
*
*                SKU NG !!
*
*          Other Card or Module not found
*
*****

```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- Connection of wireless LAN card
- Using a wrong wireless LAN card (Using unspecified card)
- Defective wireless LAN card

Checking the connection, execute the subtest again.

Subtest02 MAC Address Check

This subtest displays the MAC address. Selecting this subtest, following message will appear in the display.

```

*****
*
*          MAC = XXXXXXXXXXXXX
*
*****
*
*          MAC Address Check : OK !!
*
*****

```

Press any key and return to the test menu.

If a defective is found during the test, following message will appear in the display.

```

*****
*
*          ERROR: MAC all F
*          MAC = XXXXXXXXXXXXX
*
*****
*
*          MAC Address Check : NG !!
*
*****

```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- Connection of wireless LAN card
- Defective wireless LAN card
- Disappearance of MAC address data

Checking the connection, execute the subtest again.

Subtest03      Antenna check & communication test of 11b mode

**Caution:** To execute subtest 03-06, use another computer (with Callexico wireless LAN card) that can communicate by the wireless LAN as a responder machine to perform those tests. Access points are also required. (Access point for 802.11a, 802.11b and 802.11g )

Be sure to turn the wireless communication switch ON before executing wireless LAN communication test. (The wireless communication LED lights orange.)

Release the write-protection of floppy disk for the test.

### Setting the responder machine

Connect the responder machine to the access points (for 802.11a, 802.11b and 802.11g) with a cross cable and turn on the access points.

Insert the floppy disk containing the wireless LAN test program into the FDD of the responder machine and turn on the responder machine.

This subtest checks the connection and communication of wireless LAN antenna of Callexico 802.11b mode.

After finishing the test, **OK** message will appear in the display. Press any key and return to the test menu.

When a defective is found during the test, **NG** message will appear in the display. Press any key and following message will appear in the display. Check which antenna (Main/Aux) is defective.

```
*****
*
*           Aux Antenna Test : NG !!
*
*****
```

Press any key and return to the test menu.



When a defective is detected in the test, following typical cause is considered.

- Connection of wireless LAN card
- Connection of wireless LAN antenna cable (Main/Aux)
- Condition of wireless LAN communication (Interference/obstruction)
- Defective wireless LAN card

Checking the connection and condition, execute the subtest again.

#### Subtest04 Communication test of 11a mode

This subtest checks the communication of wireless LAN antenna of Calxico 802.11a mode.

After finishing the test, **OK** message will appear in the display. Press any key and return to the test menu.

When a defective is found during the test, **NG** message will appear in the display. Press any key and following message will appear in the display.

```
*****
*
*           11a Communication Test : NG !!
*
*****
```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- Connection of wireless LAN card
- Connection of wireless LAN antenna cable (Main)
- Condition of wireless LAN communication (Interference/obstruction)
- Defective wireless LAN card

Checking the connection and condition, execute the subtest again.

Subtest05      Communication test of 11g mode

This subtest checks the communication of wireless LAN antenna of Callexico 802.11g mode.

For more details on procedure and contents of this subtest, refer to Subtest04 Communication test of 11a mode.

Subtest06      All the tests of Callexico 11a/ g Card

This subtest checks SKU information, MAC address of Callexico 802.11a/b/g card, antenna connection and communication test of Callexico 802.11b card and communication test of Callexico 802.11a and Callexico 802.11g. The test stops at when a defective is found. For more details, refer to each subtest.

## 3.28 LAN/Modem/Bluetooth/IEEE1394 Test Program

This section describes how to perform the LAN/Modem/Bluetooth/IEEE1394 test with the test program.

Insert the test program disk for LAN/Modem/Bluetooth/IEEE1394 test in FDD and turn on the power. The following message will appear:

```
Microsoft Windows XX Startup Menu
-----
```

1. LAN
2. Modem
3. Bluetooth
4. IEEE1394

Enter a choice:

Press the number you want to test and press **Enter**.

**NOTE:** It is impossible to go back to startup menu once you choose the test. Therefore, LAN/Modem/Bluetooth/IEEE1394 test can not be executed successively.

### 3.28.1 LAN test

To execute LAN test, press **1** and **Enter**. The following message will appear:

```
#####
##### i82562 ICHx Gbe (i82540) Diagnostics program #####
#####
*
* 1 ..... (i82562 + ICHx) *
* *
* 2 ..... (Gbe) *
* *
*****
.... Press test number[1-2] ?
```

Press the number you want to test and press **Enter**.

## Subtest01 (i82562 + ICHx)

This subtest checks the operation of mini-PCI I/F by the loopback test in the chip.

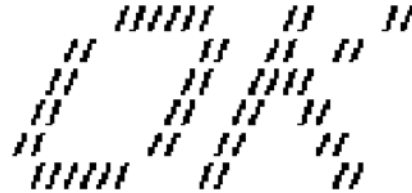
The following message will appear:

```
[LAN transmit & receive test !]
                                COMPLETED Repeat count = 00000
                                Error count   = 00000

LOOPBACK TEST

100Mbps Auto-negotiation TxRx Test
Destination Address      = xxxxxxxxxxxxxx
Source Address          = xxxxxxxxxxxxxx

** 100Base-TX Full-Duplex **
< TRANSMIT >
< RECEIVE >
```



**NOTE:** The menu displayed by your computer may be slightly different from the one shown above.

If a defective is found, **NG** message will appear in the display.

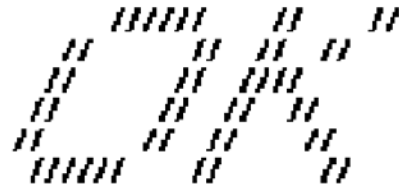
## Subtest02 (Gbe)

**CAUTION:** Gigabit Ethernet test is not supported for this model.

This subtest checks the operation of mini-PCI I/F by the loopback test in the chip. Select **2** to execute and press **Enter**.

The following message will appear:

```
Testing adapter...hit <ESC> to abort.
*
External Loopback Test...PASSED
Testing completed.
*
*
Loopback Test Complete
*
*
* 1000Base Auto-negotiation TxRx Test
*
* CE Test Complete
```



**NOTE:** The menu displayed by your computer may be slightly different from the one shown above.

If a defective is found, **NG** message will appear in the display.

### 3.28.2 Modem test

For this subtest, connect the modem PCB and RJ11 connector with a harness. Use the dedicated “FAT-MODE inspection device (product code: QE2000P01 made by Nitto Denki Seisakusyo)” for the tests.

To execute Modem test, press **2** and **Enter**. Following message will appear:

```
[Modem loopback test !]
ICHx MDC Test Program with Modem Sound (Line Test)
Version X.X
* Scorpio Modem Initialize      :OK
* Digital Loopback Test        :OK
* RJ11 Connector Check (LED)   :(Operator's Check!!)
```

**NOTE:** *The menu displayed by your computer may be slightly different from the one shown above.*

RJ11 Connection Check (LED) (Operator's Check LED) test will be executed, and the following message will appear:

```
...Press Key (Y = OK , N =NG)
```

If the color in the LED of the connection checker is orange, press **Y**, otherwise, press **N**.

### 3.28.3 Bluetooth test

**CAUTION:** Bluetooth test is not supported for this model.

To execute this test, input **3** and press **Enter**.

**Note:** Use another computer that can communicate by the Bluetooth as a reference machine to perform this test.

Insert a floppy disk containing the test program into the target machine and turn on the target machine. The following Bluetooth test menu will appear:

```
#####
##### Bluetooth sub system test program VX.XX #####
#####
*
*          1...BD_ADDR check                               *
*
*          3... Communications test (DUT mode)             *
*
*          T...communications test (TEST mode)            *
*
*****
....Press test number [1, 3, T] ? _
```

Press **1** or **3** key to perform the corresponding subtest. To quit the Bluetooth test program, eject the floppy disk and turn the computer off while the menu above is displayed.

## Subtest01 BD\_ADDR check

This subtest checks the BD\_ADDR functions. When the Bluetooth test menu is displayed, press **1** to select the test and press **Enter**. The following message will appear:

```

-----
Bluetooth Subsystem T&D for PCSE(BD_ADDR) VerX.XX Copyright (C) by TOSHIBA Co.
-----

Initializing ...

```

When the machine has passed the test, it displays BD\_ADDR. If BD\_ADDR has no problem, the following message is displayed.

```

-----
Bluetooth Subsystem T&D for PCSE(BD_ADDR) VerX.XX Copyright (C) by TOSHIBA Co.
-----

My BD_ADDR = XXXXXXXXXXXX [h]

PPPPPP  A  SSSS  SSSS
P  P  A A  S  S  S  S
P  P  A  A  S  S
PPPPPP  A  A  SSSS  SSSS
P  AAAAAA  S  S
P  A  A  S  S  S  S
P  A  A  SSSS  SSSS

```



If the target machine has any problem, it displays Error CODE. The following message is displayed.

```

-----
Bluetooth Subsystem T&D for PCSE(BD_ADDR) VerX.XX Copyright (C) by TOSHIBA Co.
-----

My BD_ADDR = XXXXXXXXXXXX [h]

FFFFFF      A      III  L
F           A A      I  L
F           A  A      I  L
FFFFFFF A      A      I  L
F           AAAAAA  I  L
F           A  A      I  L
F           A  A      III LLLLLL
    
```

Table 3-5 Error message

Message	Contents
Invalid BD_ADDR (all 00)	0x000000000000
Invalid BD_ADDR (all FF)	0xFFFFFFFFFFFF
Invalid BD_ADDR (bit0=1)	bit40=1b
Invalid BD_ADDR (bit1=1)	bit41=1b
Invalid BD_ADDR (define in the file)	Defined BD_ADDR

If the machine detects a malfunction, it indicates the error code as shown below.

The error code begins with the least significant digit.

Error code

Table 3-6 Error code for Bluetooth test (BD\_ADDR) (1/2)

Error code	Meaning
0x01	Unknown HCI Command.
0x02	No Connection.
0x03	Hardware Failure.
0x04	Page Timeout.
0x05	Authentication Failure.
0x06	Key Missing.
0x07	Memory Full.
0x08	Connection Timeout.
0x09	Max Number Of Connections.
0x0a	Max Number Of SCO Connections To A Device.
0x0b	ACL Connection already exists.
0x0c	Command Disallowed.
0x0d	Host Rejected due to limited resources.
0x0e	Host Rejected due to security reasons.
0x0f	Host Rejected due to remote device is only a personal device.
0x10	Host Timeout.
0x11	Unsupported Feature or Parameter Value.
0x12	Invalid HCI Command Parameters.
0x13	Other End Terminated Connection: Used Ended Connection.
0x14	Other End Terminated Connection: Low Resources.
0x15	Other End Terminated Connection: About to Power Off.
0x16	Connection Terminated by Local Host.
0x17	Repeated Attempts.
0x18	Paring Not Allowed.
0x19	Unknown LMP PDU.
0x1a	Unsupported Remote Feature.
0x1b	SCO Offset Rejected.
0x1c	SCO Interval Rejected.
0x1d	SCO Air Mode Rejected.
0x1e	Invalid LMP Parameters.
0x1f	Unspecified Error.

\*\* See the Specification of the Bluetooth System for details.



When the Bluetooth test menu is displayed, press **T** to select the test and press **Enter** in the test machine. The following message will appear:

```

-----
Bluetooth Subsystem T&D for PCSE(CS-Air) VerX.XX Copyright (C) by TOSHIBA Co.
-----
+-----+
|           |
|   Tester   |
|           |
+-----+

[ESC]:Finish Tester  [SPACE]:Start
Is DUT ready?

```

Then press **Space** to start the Bluetooth communication test.

When the machine has passed the test, it displays BD\_ADDR of the DUT. If the connection with the tester is completed, the progress bar stops. The following message is shown.

```

-----
Bluetooth Subsystem T&D for PCSE(CS-Air) VerX.XX Copyright (C) by TOSHIBA Co.
-----
+-----+
|           | BD_ADDR of the DUT = XXXXXXXXXXXXX [h]
+-----+

  CCCC   OOO   M   M PPPPPP L   EEEEEE TTTTTTT EEEEEEE DDDDD
C   C O   O MM   MM P   P L   E       T   E       D   D
C       O   O M M M M P   P L   E       T   E       D   D
C       O   O M M M PPPPPP L   EEEEEE T   EEEEEEE D   D
C       O   O M   M P   L   E       T   E       D   D
C   C O   O M   M P   L   E       T   E       D   D
  CCCC   OOO   M   M P   LLLLLL EEEEEE T   EEEEEEE DDDDD

Testing is finished

A>_

```

If the target machine has any problem, the following message “INCOMPLETE” is displayed with the Error Code.

```

-----
Bluetooth Subsystem T&D for PCSE(CS-Air) VerX.XX Copyright (C) by TOSHIBA Co.
-----

+-----+
|          DUT          |   BD_ADDR of the DUT = XXXXXXXXXXXXX [h]
+-----+

III N   N   CCCC   OOO   M   M P P P P P L   EEEEE TTTTTT EEEEE
I  NN   N C   C O   O MM   MM P   P L   E       T   E
I  N N   N C       O   O M M M M P   P L   E       T   E
I  N N   N C       O   O M M M P P P P P L   EEEEE T   EEEEE
I  N   N N C       O   O M   M P   L   E       T   E
I  N   NN C   C O   O M   M P   L   E       T   E
III N   N   CCCC   OOO   M   M P           LLLLLL EEEEE T   EEEEE

                                Testing is finished

_Press any key to continue. . .

```

If the machine detects a malfunction, it indicates the error code as shown below.  
The error code begins with the least significant digit.

Error code

Table 3-7 Error code for Bluetooth test (BD\_ADDR of the DUT) (1/2)

Error code	Meaning
0x01	Unknown HCI Command.
0x02	No Connection.
0x03	Hardware Failure.
0x04	Page Timeout.
0x05	Authentication Failure.
0x06	Key Missing.
0x07	Memory Full.
0x08	Connection Timeout.
0x09	Max Number Of Connections.
0x0a	Max Number Of SCO Connections To A Device.
0x0b	ACL Connection already exists.
0x0c	Command Disallowed.
0x0d	Host Rejected due to limited resources.
0x0e	Host Rejected due to security reasons.
0x0f	Host Rejected due to remote device is only a personal device.
0x10	Host Timeout.
0x11	Unsupported Feature or Parameter Value.
0x12	Invalid HCI Command Parameters.
0x13	Other End Terminated Connection: Used Ended Connection.
0x14	Other End Terminated Connection: Low Resources.
0x15	Other End Terminated Connection: About to Power Off.
0x16	Connection Terminated by Local Host.
0x17	Repeated Attempts.
0x18	Paring Not Allowed.
0x19	Unknown LMP PDU.
0x1a	Unsupported Remote Feature.
0x1b	SCO Offset Rejected.
0x1c	SCO Interval Rejected.
0x1d	SCO Air Mode Rejected.
0x1e	Invalid LMP Parameters.
0x1f	Unspecified Error.

\*\* See the Specification of the Bluetooth System in detail.

Table 3-7 Error code for Bluetooth test (BD\_ADDR of the DUT) (2/2)

Error code	Meaning
0x20	Unsupported LMP Parameter Value.
0x21	Role Change Not Allowed.
0x22	LMP Response Timeout.
0x23	LMP Error Transaction Collision.
0x24	LMP PDU Not Allowed.
0x25	Not Exist
0x26	Not Exist
0x27	Not Exist
0x28	Not Exist
0x29	Not Exist
0x2a	Not Exist
0x2b	Not Exist
0x2c	Not Exist
0x2d	Not Exist
0x2e	Not Exist
0x2f	Not Exist

\*\* See the Specification of the Bluetooth System in detail.

### 3.28.4 IEEE1394 test

To execute this test, input **4** and press **Enter**.

**NOTE:** Use another computer that can communicate by IEEE1394 (i. Link) cable as a reference machine to perform this test.

The following menu will appear:

```

*****
*****      IEEE1394[XXXXX] Diagnostics program      *****
*****
*
*          1 ....(Transmit & Receive test)          *
*
*          2 ....(Responder set)                    *
*
*          3 ....(1394 GUID Display)                *
*
*****
.... Press test number[1-3] ?

```

To execute the TEST, select the test number you want to execute and press **Enter**.

Subtest01      Transmit & Receive test

**NOTE:** Before executing subtest 01, be sure to execute subtest 02 in the responder machine.

This program checks the data transporting between responder machine and target machine and compare them with the original data through the IEEE1394 cable.

Subtest02      Responder set

This program is executed in the responder machine to initialize the responder machine with the IEEE1394 cable connected to the target machine before executing subtest 01.

Subtest03      IEEE1394 GUID Display

This program checks the GUID of IEEE1394.



## 3.29 Sound Test program

This section describes how to perform the Sound test. To execute the sound test, refer to the following description.

Insert the test program disk for Sound test in the floppy disk drive and turn on the power. The following message will appear:

```
#####
#####      WSS, Sound blaster pro Diagnostics program      #####
#####
*
*      1 .....      Sound (Standard)      *
*
*      2 .....      Sound (Legacy)      *
*
*      3 .....      CD Sound (Standard)  *
*
*      4 .....      CD Sound (Legacy)    *
*
*      ---It outputs at the speaker and lineout---
*
*
*****
... Press test number[1-4] ?
```

Input the test number and press **Enter**.

### 3.29.1 Sound (Standard)

To execute the Sound (Standard) test, press **1** and **Enter**. The following menu will appear in the display.

```
#####
#####      ICH4-M + AD1981A Diagnostics program      #####
#####
*
*      1 ..... ( Microphone recording & play )      *
*
*      2 ..... ( Sine wave )      *
*
*      3 ..... ( Line IN recording & play )      *
*
*      9 ..... Exit to Main      *
*
*****
.. Press test number[1-3, 9] ?
```

To return to the Sound test menu, Press **9** and **Enter**. Then following message will appear in the display.

```
*****
*****  May I Restart ?  *****
*****
Press any key to continue..
```

After pressing any key, the machine starts rebooting and sound test menu will appear in the display.

#### Subtest01 Microphone recording & play

This subtest checks the function of the CODEC A/D, D/A converter.

When this subtest is selected, the following message will appear.

```
[Recording & play test !]
```

And the following message will appear.

```
DOS/4GW Protected Mode Run-time Version X.XX
Copyright (c) Tenberry Software, Inc. XXXX
```

After this message appears, display stops briefly. In this timing, sound is recorded from internal microphone.

After the recording is completed, the computer plays back the sound recorded after the following message.

```
STACWAVE Version X.XX
Build data: XXX XX XXXX at XX:XX:XX
Loading "mic.wav".
```

<p><b>NOTE:</b> <i>The message in the display might have slight difference from those above.</i></p>
--

The display returns to the Sound (Standard) test menu after the test ends.

**Subtest02 Sine Wave**

This subtest is executed by loading the COM file (ADSIN.COM). The program expands sine wave data table from 16KB to 64KB, and creates the play data. Then it transfers the data between the DMA and the CODEC to play the sine wave. (It sounds like a continuous beep). By using wave measurable devices such as an oscilloscope, the data can be measured as a sine wave.

When the subtest is executed, the sine wave is played while expanding sine wave from 16KB to 64KB.

The display returns to the Sound (Standard) test menu after the test ends.

**Subtest03 Line IN recording & play**

This subtest executes the same test as the subtest01 by recorded sound from the different port (Line-in port).

For more details on the subtest, refer to the subtest01 Microphone recording & play.

The display returns to the Sound (Standard) test menu after the test ends.

**3.29.2 Sound (Legacy)**

To execute the Sound (Legacy) test, select **2** and press **Enter**.

**CAUTION:** *Sound (Legacy) test is not supported in this model.*

### 3.29.3 CD Sound (Standard)

To execute the CD Sound (Standard) test, press **3** and **Enter**. Insert the test media (TOSHIBA TEST CD-ROM or ABEX TEST CD-ROM) or music CD on the market (if the test media can not be prepared). Following menu appears in the display.

For details on use of test media, refer to (1) Test media (Toshiba-made test media).  
For details on use of audio CD on the market, refer to (2) Audio CD.

#### (1) Test media (Toshiba-made test media)

```
CD/DVD TEST  IN PROGRESS XXXXXXXX
```

<pre>xxxxxxx DIAGNOSTIC TEST VX.XX [Ctrl]+[Break] : test end [Ctrl]+[C]      : key stop</pre>
---

```
SUB-TEST      : XX
PASS COUNT    : XXXXX      ERROR COUNT: XXXXX
WRITE DATA   : XX         READ DATA  : XX
ADDRESS       : XXXXXXX    STATUS       : XXX
```

```
01 - Japanese Narration
02 - English Narration
03 - Test Tone A (100Hz - 20Hz)
04 - Test Tone B (400Hz - 3KHz L-R)
```

```
Drive # = 0, ATAPI status =00
Command = XX
[[Block address = XXXXXXXXX]]
[[Block length  = XXXXXXXXX]]
Final : Block address = XXXXXXXXX
```

#### Subtest01 Japanese Narration

Selected this subtest, narration in Japanese starts and following message appears in the display.

```
Play start CD sound !
Press any key <Play stop>.
```

Press any key and stop the narration. Then return to the CD Sound (Standard) test menu.

## Subtest02 English Narration

Selected this subtest, narration in English starts.

For more details on the procedure, refer to the subtest01.

## Subtest03 Test Tone A

**Caution:** Before starting subtest03, be sure to set the sound at proper volume.

This subtest plays sine wave while changing its table from 100Hz to 20Hz.

Return to the CD Sound (Standard) menu after the test ends.

## Subtest 04 Test Tone B

This subtest plays sine wave while changing its table from 400Hz to 3KHz and also changing the channel from left speaker to right speaker.

Return to the CD Sound (Standard) menu after the test ends.

## (2) Audio CD

Insert an audio CD and the following menu appears in the display.

```

CD/DVD TEST  IN PROGRESS XXXXXXXX

```

```

xxxxxxx DIAGNOSTIC TEST VX.XX
[Ctrl]+[Break] : test end
[Ctrl]+[C]      : key stop

```

```

SUB-TEST      : XX
PASS COUNT    : XXXXX      ERROR COUNT: XXXXX
WRITE DATA   : XX         READ DATA  : XX
ADDRESS       : XXXXXXXX   STATUS       : XXX

```

```

CD Sound track number (01-98 : Track) ?

Drive # = 0, ATAPI status =00
Command = XX
[[Block address = XXXXXXXXX]]
[[Block length  = XXXXXXXXX]]
Final : Block address = XXXXXXXXX

```

Select the track number you want to test and press **Enter** twice.

The following message appears in the display and selected track is played.

```

Play start CD sound !
Press any key <play stop>

```

After pressing any key, the music stops and the display returns to the selection menu of the track number.

**NOTE:** When the CD-ROM test is executed, "ALL DEVICE" must be selected in the [Device Config.] of the BIOS SETUP. If the "ALL DEVICE" is not selected, music can not be played.

### 3.29.4 CD Sound (Legacy)

To execute the CD Sound (Legacy) test, select **4** and press **Enter**.

**CAUTION:** Sound (Legacy) test is not supported in this model.

## 3.30 SETUP

### 3.30.1 Function Description

This program displays the current system setup information as listed below:

1. Memory
2. System Date/Time
3. Battery
  - (a) Battery Save Mode
  - (b) PCI Express Link ASPM
4. Password
5. HDD Password
  - (a) HDD
  - (b) HDD Password Mode
  - (c) User Password
  - (d) Master Password
6. Boot Priority
  - (a) Boot Priority
  - (b) HDD Priority
7. Others
  - (a) Dynamic CPU Frequency Mode
  - (b) EXECUTE-Disable Bit Capability
  - (c) Auto Power On
  - (d) Diagnostic Mode
  - (e) Standby
8. Configuration
9. I/O port
10. Drives I/O
  - (a) Built-in HDD
  - (b) Selected Bay
11. PCI Bus
12. Security Controller
  - (a) TPM
  - (b) Clear TPM Owner

13. Display

- (a) Power On Display
- (b) LCD Display Stretch
- (c) TV type

14. Peripheral

- (a) Internal Pointing Device
- (b) Parallel Port Mode

15. LEGACY EMULATION

- (a) USB KB/Mouse Legacy Emulation
- (b) USB-FDD Legacy Emulation
- (c) USB Memory BIOS Support Type

16. PCI LAN



### 3.30.2 Accessing the SETUP Program

Selecting **0** from the DIAGNOSTICS MENU and pressing **Enter** displays the followings:

SYSTEM SETUP (1/2) ACPI BIOS version = X.XX

<p style="text-align: center;">MEMORY</p> <p>Total = XXXXX KB</p>	<p style="text-align: center;">BOOT PRIORITY</p> <p>Boot Priority = HDD→FDD→CD-ROM→LAN HDD Priority = Built-in HDD→Second HDD</p>
<p style="text-align: center;">SYSTEM DATE/TIME</p> <p>Date(MM-DD-YY) = XX-XX-XXXX Time(HH:MM:SS) = XX:XX:XX</p>	<p style="text-align: center;">OTHERS</p> <p>Dynamic CPU Frequency Mode = Dynamically Switchable Execute-Disable Bit Capability = Not Available Auto Power On = Disabled Diagnostic Mode = Disabled Standby = Normal</p>
<p style="text-align: center;">BATTERY</p> <p>Battery Save Mode = Full Power PCI Express Link ASPM = Auto</p>	
<p style="text-align: center;">PASSWORD</p> <p>Not Registered</p>	
<p style="text-align: center;">HDD PASSWORD</p> <p>HDD = Built-in HDD HDD Pasword = User Only User Password = Not Registered Master Password = Not Registered</p>	

↓↑←→: Select items    Space, BkSp: Change values    PgDn, PgUp: Change pages  
Esc: Exit without saving    Home: Set default values    End: Save changes and Exit

SYSTEM SETUP (2/2) ACPI BIOS version = X.XX

<p style="text-align: center;">CONFIGURATION</p> <p>Device Config. = Setup by OS</p>	<p style="text-align: center;">DISPLAY</p> <p>Power On Display = Auto-Selected LCD Display Stretch = Enabled TV Type = NTSC (JAPAN)</p>
<p style="text-align: center;">I/O PORTS</p> <p>Parallel = LPT1 (378H/IRQ7/CH3) (*1)</p>	<p style="text-align: center;">PERIPHERAL</p> <p>Internal Pointing Device = Enabled Parallel Port Mode = ECP(*1)</p>
<p style="text-align: center;">DRIVERS I/O</p> <p>Built-in HDD = Primary IDE(1F0H/IRQ14) Select Bay = Secondary IDE(170H/IRQ15)</p>	<p style="text-align: center;">LEGACY EMULATION</p> <p>USB KB/Mouse Legacy Emulation = Enabled USB-FDD Legacy Emulation = Enabled USB Memory BIOS Supportr Type =HDD</p>
<p style="text-align: center;">PCI BUS</p> <p>PCI BUS = IRQ10, IRQ11</p>	<p style="text-align: center;">PCI LAN</p> <p>Built-in LAN = Enabled</p>
<p style="text-align: center;">SECURITY CONTROLLER</p> <p>TPM = Disabled Clear TPM Owner</p>	

↓↑←→: Select items    Space, BkSp: Change values    PgDn, PgUp: Change pages  
Esc: Exit without saving    Home : Set default values    End: Save changes and Exit

**NOTE:** (\*1) This item is displayed only when a Tablet Multi Dock II is connected.

### Moving Within the SETUP Menu and Changing Values

1. Press ← and → to move between the two columns. Press ↑ and ↓ to move between items in a column. Press **Fn+↑ (PgUp)** and **Fn + ↓ (PgDn)** to move between the two pages.
2. Press either the **Space bar** or **Back Space** to change the value.

### Accepting Changes and Exiting the SETUP Window

1. Press **End** to accept the changes you made.

If the changed item does not require the system to reboot, the following message is displayed:

```
Are you sure? (Y/N)
```

If the changed item requires the system to reboot, the following message is displayed:

```
Are you sure? (Y/N)  
The changes you made will cause the system to reboot.
```

2. To make other changes, press **N**. Repeat the steps above.
3. To accept the changes, press **Y**.

**NOTE:** You can press **Esc** to quit at any time without saving changes. *SETUP* asks you to confirm that you do not want to save your changes. When *SETUP* is displayed at the next time, the current configuration appears.

### The Factory Preset Configuration

When you access *SETUP*, the current configuration is displayed.

1. To show the factory preset configuration, press **Home**.
2. To accept the default settings, press **End** and then press **Y**.

**NOTE:** When you execute the default setting, the following settings are not changed:  
*Password*

## SETUP Options

The SETUP screen is divided into 15 functionally related groups. This section describes each group and its options.

### 1. Memory

This group of options displays the computer's memory.

This field displays the total amount of memory installed and is automatically calculated by the computer. You cannot change this value.

### 2. System Date/Time

Sets the date and time.

**System Date**            Sets date.

**System Time**           Sets time.

### 3. Battery

#### (a) Battery Save Mode

This option is used to select **Full Power**, **Low Power** or **User Setting** of the battery save mode. When you select the battery save mode, the followings will appear.

**Full Power**    The following shows full power settings.

```

— BATTERY SAVE OPTIONS —
Processing Speed      = High
CPU Sleep Mode       = Enabled
LCD Brightness       = Bright (*1)
Cooling Method       = Super-Bright (*2)
                     = Maximum Performance
  
```

**Low Power**    The following shows low power settings.

```

— BATTERY SAVE OPTIONS —
Processing Speed      = Low
CPU Sleep Mode       = Enabled
LCD Brightness       = Semi-Bright (*1)
Cooling Method       = Bright (*2)
                     = Battery Optimized
  
```

**NOTE:** Display of the LCD Brightness will be changed in the condition below:

(\*1) Operating the battery

(\*2) Using the AC adapter

**User Setting** Use this option to set the battery save parameters on the sub-window, **BATTERY SAVE OPTIONS**.

#### Battery Save Options

##### Processing Speed

This feature changes the CPU processing speed.

**High** CPU operates at 1.6/1.73/1.87/2.0/2.13GHz (Pentium-M),  
(Default in Full Power Mode)

**Low** CPU operates at half processing speed.  
(Default in Low Power Mode)

##### CPU Sleep Mode

Use this option to enable or disable the CPU sleep function.

**Enabled** Enables sleep mode. (Default)

**Disabled** Disables sleep mode.

##### LCD Brightness

Use this option to set the level of LCD brightness.

**Super-Bright** Full brightness for maximum visibility.

**Bright** Full brightness for high visibility.

**Semi-Bright** Less than full brightness for saving power.

Cooling Method

<b>Maximum Performance</b>	If the CPU becomes too hot, the fan turns on automatically in a high speed to cool down the CPU.
<b>Performance</b>	If the CPU becomes too hot, the fan turns on automatically. When the CPU temperature falls to a normal range, the fan turns off.
<b>Battery optimized</b>	If the CPU becomes too hot, the processing speed is lowered. If the temperature is still too high, the fan turns on. When the CPU temperature falls to a normal range, the fan is turned off and the processing speed is increased.

**NOTE:** Too hot condition may cause defect on the CPU. When the hot condition continues, the power is automatically turned off in resume mode.

## (b) PCI Express Link ASPM

This option sets the power saving function of the PCI Express.

<b>Auto</b>	Saves power consumption, when the PCI Express device is not used while the battery is working. (Default)
<b>Disabled</b>	Disables the power saving function and gives priority to the performance.
<b>Enabled</b>	Saves power consumption, when the PCI Express device is not used.

## 4. Password

This option sets or resets the user password for power on and instant security (**Fn+F1**).

<b>Registered</b>	The user password has been registered.
<b>Not registered</b>	The user password has not been registered.

For details on setting the user password, refer to the User's Manual.

## 5. HDD Password

This option registers, resets or changes the HDD password.

### (a) HDD

Hard disk for setting the password.

**Built-in HDD** The password is set to Built-in HDD. (This cannot be changed.)

### (b) HDD Password Mode

This item registers HDD Password and can be selected only for registering HDD password. To change HDD Password Mode when HDD Password is registered, delete the registered HDD Password first, and then register new password.

**User Only** Sets only User HDD Password (Default)

**Master+User** Sets Master HDD Password and User HDD Password

### (c) User Password

This item sets User password.

For details on setting user password, refer to the User's Manual.

### (d) Master Password

This item sets the Master HDD password.

This can be set, only when **Master+User** is set in the HDD password Mode.

For details, refer to the User's Manual.

## 6. Boot Priority

## (a) Boot Priority

Use this option to set the priority for booting of the computer and the priority for the HDD for booting.

**FDD→HDD→CD-ROM→LAN:** The computer looks for bootable files in the following order: FDD, HDD, CD-ROM (\*1) and LAN

**HDD→CD-ROM→LAN→FDD:** The computer looks for bootable files in the following order: HDD, CD-ROM, LAN and FDD.

**FDD→CD-ROM→LAN→HDD:** The computer looks for bootable files in the following order: FDD, CD-ROM, LAN and HDD.

**CD-ROM→LAN→HDD→FDD:** The computer looks for bootable files in the following order: CD-ROM, LAN, HDD and FDD.

**CD-ROM→LAN→FDD→HDD:** The computer looks for bootable files in the following order: CD-ROM, LAN, FDD and HDD.

**HDD→FDD→CD-ROM→LAN:** The computer looks for bootable files in the following order: HDD, FDD, CD-ROM and LAN. (Default)

**NOTE:** CD-ROM refers to an Optical drive.

**NOTE:** When a floppy disc drive is not connected, it boots up from SD memory card in spite of selecting FDD.

## (b) HDD Priority

Use this option to set the starting method from hard disk drive.

**Built-in HDD → Second HDD**

: Detecting boot command from Built-in HDD first and then second HDD (Default)

**Second HDD → Built-in HDD**

: Detecting boot command from Second HDD and then Built-in HDD

**Built-in HDD → Second HDD→USB**

: The priority is set as Built-in HDD → Second HDD→USB.

**Second HDD → Built-in HDD→USB**

: The priority is set as Second HDD → Built-in HDD→USB.

**Built-in HDD → USB → Second HDD**

: The priority is set as Built-in HDD → USB → Second HDD.

**Second HDD → USB → Built-in HDD**

: The priority is set as Second HDD → USB → Built-in HDD.

**USB → Built-in HDD → Second HDD**

: The priority is set as USB → Built-in HDD → Second HDD.

**USB → Second HDD → Built-in HDD**

: The priority is set as USB → Second HDD → Built-in HDD.

**NOTE:** *If the boot command can not be detected from the prior HDD, booting target changes to other devices.  
Some modules may not be displayed.*

## 7. Others

Whether or not you need to configure the computer with these options depends primarily on the kind of software or peripherals you use.

## (a) Dynamic CPU Frequency Mode

Use this option to choose a setting from the followings. When the CPU of the computer is Celeron-M, this option is not displayed.

**Dynamically Switchable**

	Enables Pentium-M processor featuring Intel SpeedStep technology. (Default)
<b>Always High</b>	Disables Pentium-M processor featuring Intel SpeedStep technology and always runs the processor at its maximum speed.
<b>Always Low</b>	Disables Pentium-M processor featuring Intel SpeedStep technology and always runs the processor at its default speed.



## (b) EXECUTE-Disable Bit Capability

Selects the function to reports whether the CPU Execute-Disable Bit is available or not to OS. The Execute-Disable Bit Capability is a function that strengthens the security to protect PC from the buffer overflow attack by a computer virus and an illegal access.

**Available**                      Make the Execute-Disable Bit Capability usable.  
(Available)

**Not Available**                Disables the Execute-Disable Bit Capability.  
(Not Available) (Default)

## (c) Auto Power On

This option displays setting for Auto Power On.

**Disabled**                      Indicates auto power on is not set.

**Enabled**                        Indicates auto power on is set.

When “Enabled” is selected, the following sub-window appears.

## OPTIONS

Alarm Time	= 00:00:00
Alarm Date Option	= Disabled
Wakeup on LAN	= Disabled

Set the parameters for the Auto Power On (automatic power on) function in the “OPTIONS” window. To set the time, use **Space** or **BackSpace**. Press ↓ to move the cursor to the right and ↑ to move the cursor to the left when you set the date and time.

For the **Alarm Time**, set the time to turn on the power automatically. The “second” cannot be set. When it is set to “Disabled”, the time to turn on automatically is not set.

For the **Alarm Date Option**, set the date to turn on the power automatically. When it is set to “Disabled”, the time to turn on automatically is not set.

The **Ring Indicator** is displayed only when the computer is in Resume mode and this function cannot be used for a PC card-type modem. When any modem is not installed, it is not displayed.

- NOTE:**
1. Do not remove the AC adapter and battery pack at the same time when you use this feature. If you do so, data saved by the resume function will be lost. You must also reset this option.
  2. If you have set a password and the computer boots by the Auto Power On function and Standby is on, the computer will start with the instant security function enabled. The **password =** message is not displayed; however, you must enter the password to use the computer.
  3. This option is enabled only once, the setting is reset, after booting up.

(d) Diagnostic Mode

This option sets whether the BIOS Setup Diagnostic test is enabled.

- |                 |                                 |
|-----------------|---------------------------------|
| <b>Disabled</b> | The Diagnostic test is disabled |
| <b>Enabled</b>  | The Diagnostic test is enabled. |

(e) Standby

Use this option to set the start speed of operation from standby mode.

- |               |   |
|---------------|---|
| <b>Normal</b> | Normal speed of start to Windows operation. (Default)   |
| <b>Fast</b>   | Quick start to Windows operation. It consumption more electricity than normal mode. It lights orange during standby mode. |

**NOTE:** You can not choose standby mode with the setting [Fast] when the PC is running with battery.

## 8. Configuration

This option lets you set the device configuration.

<b>All Devices</b>	BIOS sets all devices.
<b>Setup by OS</b>	Initializes devices, which is needed to load an operating system. Operating system initializes other devices.

**NOTE:** (1) When using installed OS, selecting “Setup by OS” is recommended.  
 (2) When executing test programs, be sure to select “ALL Devices”.

## 9. I/O port

## (a) Parallel

This option sets the interrupt request level (IRQ) and I/O port base address for the parallel port. When the “Parallel Port Mode” is set to **Std. Bi-direct**, the options are:

LPT setting	Interrupt level	I/O address
LPT 1	7	378H
LPT 2	5	278H
LPT 3	7	3BCH
Not Used	Disables port	

When the “Parallel Port Mode” (see settings below) is set to **ECP**, the DMA channel can also be set to **1** or **3**. The default is **3**.

LPT setting	Interrupt level	I/O address	DMA channel
LPT 1	7	378H	3 (Parallel port default)
LPT 2	5	278H	3
LPT 3	7	3BCH	3
Not Used	Disables the port		

When you select one of the above options, except for **Not Used**, a sub window similar to the one below appears to let you set the DMA. The options for this setting are Channel 1 and Channel 3 (Default).

**OPTIONS**  
 DMA = Channel 3 (Default)

For most printers, the port should be set to **ECP**. With some other parallel devices, the setting should be **Std. Bi-Direct**.

## 10. Drives I/O

This option displays the address and interrupt level for hard disk drive and optical disk drive. It is for information only and cannot be changed.

<b>Built-in HDD</b>	This item cannot be changed.
<b>Select Bay</b>	This item cannot be changed.

## 11. PCI Bus

This option displays the interrupt level for the Card Bus in the computer. It is for information only and cannot be changed.

PCI BUS = IRQ10, IRQ11

## 12. Security Controller

(a) **TPM**

Disables the security controller called TPM (Trusted Platform Module). When the cursor is on the **Enable (Disable)** and the **Space** is pressed, message is displayed and the PC waits **Y** or **N** key input by the user. When **Y** is pressed, it is sets to **Enable (Disable)**. After changing, the cursor could not be moved on the **TPM** tem. This option can be changed after rebooting.

<b>Disabled</b>	Disables the TPM. (Default)
<b>Enabled</b>	Enables the TPM.

(b) **Clear TPM Owner**

This is not displayed when the **TPM** is set to **Disabled**. This is executed, when the PC is disposed or the owner of the PC changes. When the cursor is on this item and the **Space** is pressed, message is displayed and the PC waits **Y, E, S** and **Enter** key inputs by the user. When **Y, E, S** and **Enter** keys are pressed, the data is disposed. After changing, the display of **TPM** item is changed to **Disabled** and this item becomes not displayed and the cursor could not be moved on the **TPM** item.

## 13. Display

This group of options configures the computer's display.

## (a) Power On Display

This option is used to select the display when booting up.

**Auto-Selected**        Selects an external monitor if one is connected.  
Otherwise it selects the internal LCD. (Default)

**LCD +Analog RGB**    Selects both the internal LCD and the external CRT for  
simultaneous display.

**System LCD only**    Selects only internal LCD display even if the external  
monitor is connected.

**NOTE:** *When starting the computer in Standby or Hibernation, the last configuration is saved. If data does not appear on the display you are using after starting in Standby or Hibernation, press **Fn+F5** to change the active display device.*

*When an external CRT display, which does not support SVGA mode is connected and "LCD+AnalogRGB" is selected, the external display is not displayed.*

## (b) LCD Display Stretch

LCD Display Stretch enables or disables a larger display area of the screen.

**Enabled**              Enables the LCD display stretch feature. (Default)

**Disabled**             Disables the LCD display stretch feature.

## (c) TV type

This option allows you to select the type of TV.

**NTSC (Japan)**        ; TV in Japanese system

**NTSC (US)**            ; TV in the U.S. system

**PAL**                    ; TV in Europe etc. system

## 14. Peripheral

Use this option to select the peripheral's mode.

## (a) Internal Pointing Device

This option enables or disables the touch pad

**Enabled**              Enables the touch pad. (Default)

**Disabled**             Disables the touch pad.

## (b) Parallel Port Mode

The options in this tab are ECP and Standard Bi-directional.

**ECP** Sets the port mode to Extended Capabilities Port (ECP). For most printers, the port should be set to ECP. (Default)

**Std. Bi-Direct.**

This setting should be used with some other parallel devices.

## 15. LEGACY EMULATION

## (a) USB KB/Mouse Legacy Emulation

This option sets the Legacy support condition of the USB keyboard and the USB mouse.

**Enabled** Enables LEGACY support. (Default)  
USB keyboard/USB mouse are available without the driver.

**Disabled** Disables LEGACY support

## (b) USB-FDD Legacy Emulation

This option sets the Legacy support condition of the USB floppy disk drive. When a computer is FDD built-in model, this option is not displayed.

**Enabled** Enables LEGACY support. (Default)  
USB floppy disk is available without the driver.

**Disabled** Disables LEGACY support

## (c) USB Memory BIOS Support Type

This option sets the type of the USB memory as a startup device.

**HDD** Sets the type of the USB memory to be equivalent to the HDD (Default). (Based on the [HDD] order in the [Boot Priority Options] item. The order with respected to the other HDD can be set in the [HDD Priority Options] item.)

**FDD** Sets the type of the USB memory to be equivalent to the FDD. (Based on the [HDD] order in the [Boot Priority Options] item.)

## 16. PCI LAN

This option sets the Enable / Disable of the built-in LAN functions.

**Enabled** Enables built-in LAN functions. (Default)

**Disabled** Disables built-in LAN functions.



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## **Chapter 4**

# **Replacement Procedures**

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## 4 Replacement Procedures

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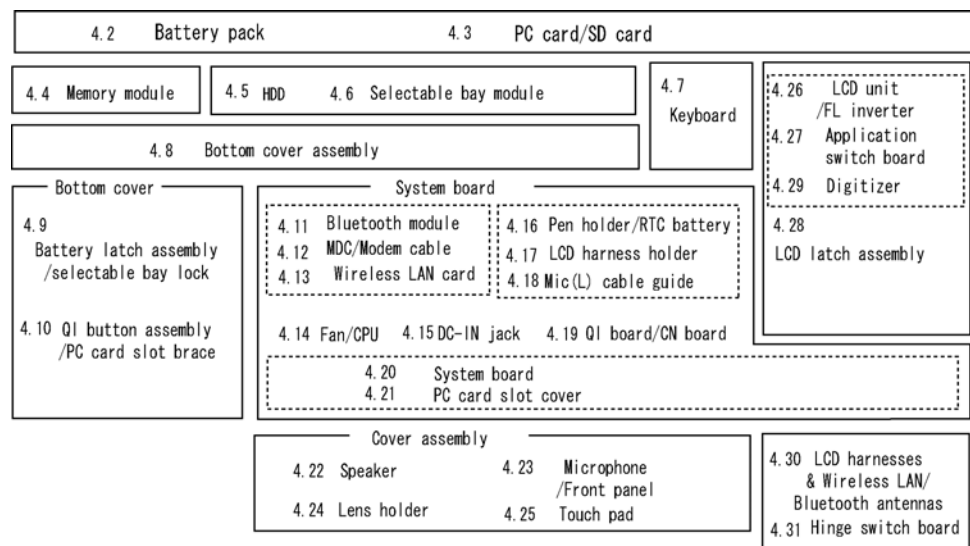
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## 4.1 Overview

This chapter describes the procedure for removing and replacing the field replaceable units (FRUs) in the PC. It may not be necessary to remove all the FRUs in order to replace one. The chart below provides a guide as to which other FRUs must be removed before a particular FRU can be removed. The numbers in the chart indicate the relevant section numbers in this manual.

In all cases when removing an FRU, the battery pack must also be removed. When repairing an FRU that is the potential cause of a computer fault, use the chart to determine the order in which FRUs need to be removed.



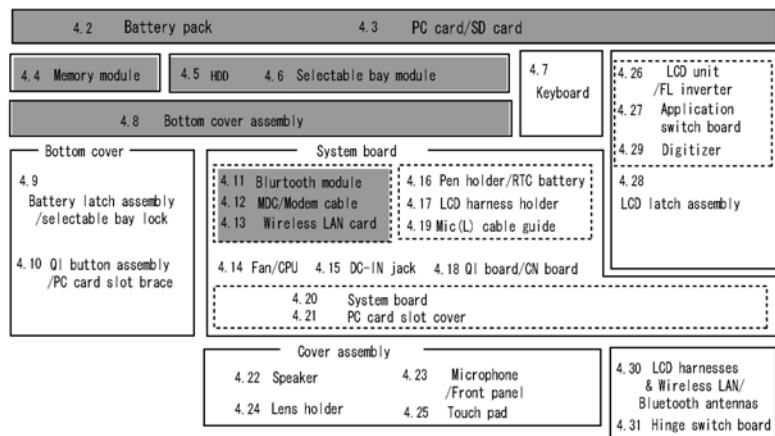
### Chart Notation

The chart shows the case for the following example:

### Removing the Wireless LAN module

All FRUs down to the “4.12 MDC/Modem cable” unit immediately above the Mini PCI module must be removed.

Similarly, as this requires the removal of all the units from “4.3 PC card/SD card” to “4.8 Bottom cover assembly” must be also removed.



## Safety Precautions

Please read the following safety instructions before disassembling the computer and always follow the instructions while working on the computer.

**Danger:** 1. In the case of the battery, always use authentic parts or equivalent parts approved by Toshiba. Other batteries may have different specifications that are incompatible with the computer and may result in fire or explosion. Due to the risk of alkali fluid leaks, never attempt to heat or disassemble the battery. Similarly, due to the risk of explosion, never expose the battery to flame.

2. Some parts including the power supply and FL inverter generate high voltages. If you need to turn on the power while disassembling the computer, do not touch any connectors or other components due to the risk of electric shock. Also, do not disassemble individual parts when performing routine maintenance.

**Warning:** 1. To prevent electric shock, turn off the power and unplug the AC adapter from the power source.

2. As the battery installed to the computer is typically already charged, the risk of electric shock remains even when the AC adapter is unplugged from the socket. To prevent electric shock, always take off any metal jewelry or accessories such as necklaces, bracelets or rings before working on the computer. Never work with wet or moist hands.

3. Take care not to injury yourself on any edges or corners.

**Caution:** 1. Confirm that replacement parts have compatible specifications before replacing on the computer. Never use incorrect parts as these may cause faults on the computer.

2. To prevent internal damage such as short circuits or burning, do not allow any screws, paper clips, or other metal objects to fall into the computer. When removing screws, always replace with the same size screw. Ensure that all screws are fully tightened. Loose screws may result in short circuits leading to overheating, smoke or flame.

3. To prevent electric shock, check that you have disconnected all cables from a part before removing the part.

4. When connecting to the AC power supply, use only an AC adapter and cable approved by Toshiba.

5. To prevent electric shock, ensure that all replacement parts are compatible with the computer and that all cables and connectors are securely connected.

**Before You Begin**

Take note of the following points before starting work. Always remove the AC adapter and battery pack before commencing any of the procedures. The procedure for removing the battery pack is described in section “4.2. Battery Pack”.

1. Do not disassemble the computer unless it is operating abnormally.
2. Use the designated tools.
3. Ensure that the environment for working on and storing parts does not contain any of the following.
  - Dust or dirt
  - Static electricity
  - Extremely hot, cold, or humid conditions
4. Perform the diagnostic tests described in Chapter 2 to determine which FRU is the cause of the fault.
5. Do not perform any unnecessary work. Always work in accordance with the disassembly and re-assembly procedures in this manual.
6. Keep parts removed from the computer in a safe place away from the computer where they will not be damaged or interfere with your work.
7. Disassembling requires the removal of a large number of screws. Keep removed screws in a safe place such that you can determine which screws belong to which part.
8. When reassembling, ensure that you use the correct screws and fit parts in the correct position. Screw sizes are noted in the text and figures.
9. As all parts have sharp edges and corners, take care not to cut yourself.
10. After replacing an FRU, check that the computer and replaced part operate correctly.



## Disassembly Procedure

Three main types of cable connector are used.

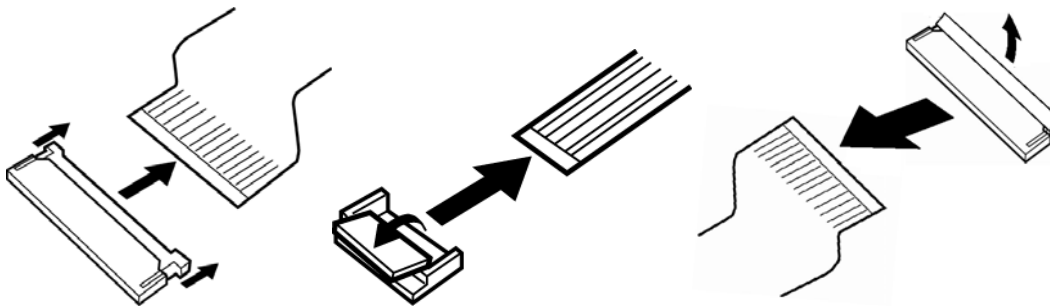
- Pressure plate connector
- Spring connector
- Normal pin connector

When disconnecting a pressure plate connector, lift up the tag on one side of the plastic pressure plate on the connector and pull the cable out from the connector. When reconnecting a cable to a pressure plate connector, lift up the pressure plate to a suitable height and insert the cable into the connector. Press down on both sides of the pressure plate such that both sides of the plate and connector are at the same height and that the cable is fixed in the correct position. Pull the cable to ensure that it is securely connected. If the cable is disconnected from the connector, reconnect it making sure that you lift the pressure plate high enough to insert fully the cable.

For spring connectors, lifting up the stopper frees the cable and allows it to be pulled out. To reconnect, hold the stopper in the up position and insert the cable, then lower the stopper to secure the cable.

For back flip connectors, lifting up the flip plate frees the cable and allows it to be pulled out. To reconnect, hold the flip plate in the up position and insert the cable, then lower the flip plate to secure the cable.

Normal pin connectors are used for all other cables. Simply pull out or push in these connectors to disconnect or reconnect.



Pressure plate connector

Spring connector

Back flip connector

## Assembly Procedure

After the computer has been disassembled and the part that caused the fault has been repaired or replaced, the computer must be reassembled.

Take note of the following general points when assembling the computer.

Take your time and follow the instructions carefully. Hurrying the assembly work will only introduce new problems.

Check that all cables and connectors are securely connected.

Before fastening FRUs or other parts in place, ensure that no cables are caught on screws or the FRU.

Check that all latches are securely closed.

Ensure that you have installed all FRUs correctly and do not have any screws left over. Using an incorrect screw may damage the thread or screw head and result in the FRU not being securely fastened in place.

After installing FRUs, check that the computer operates correctly.

## Tools and Equipment

For your safety and the safety of the people around you, it is important that you use Electrostatic Discharge (ESD) equipment. Correctly utilizing of the equipment increases the percentage of successful repairs and saves on the cost of damaged or destroyed parts. The following equipment is required for disassembly and assembly.

One Philips screwdriver with type 0 bit (for THIN HEAD screws)

One Philips screwdriver with type 1 bit (for screws other than above)

Tweezers (for lifting screws)

ESD mats (lay on work table or floor)

An ESD wrist strap and heel grounder

Anti-static carpet or flooring

A pair of needle-nose pliers

Air-ionizers in highly static sensitive areas

Antenna coaxial cable disconnecter

## Screw Tightening Torque

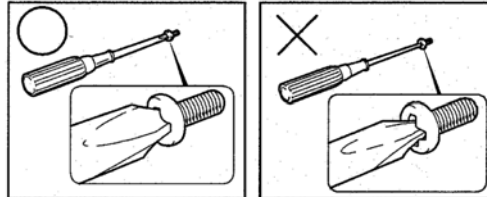
Use the following torque when tightening screws.

**Caution:** Overtightening may damage screws or parts. Undertightening may allow screws to loosen (and possibly fall out) causing a short circuit or other damage.

**Note:** To tighten screws quickly and accurately, an electric screwdriver is recommended.

M2 (2mm)	0.167 N•m (1.7 kgf•cm)
M2.5 (2.5mm)	0.294 N•m(3.0 kgf•cm)
M3 (3mm)	0.549 N•m(5.6 kgf•cm)

**Note:** To prevent damage to THIN HEAD screws, use type 0 pit philips screwdriver. Use, however, the PH point size “1” screwdriver for screws fixing the expansion memory slot cover and the keyboard. Press along the axis of the screwdriver while turning the screw. This is because the contact area between the screw and driver is less than for a pan head screw (standard pan-shaped screw head).



## Grip Color

Some screws have a colored grip area to help you determine the length of the screw.

Even numbered length screws: Brown

Odd numbered length screws: White

Special length screw: Blue

“Special length screw” means screws whose length is indicated in an integral number to the first decimal places such as 2.5 mm, 2.6 mm and so on.



## Screw Notation

To make maintenance of the computer easier, markings of the kinds of the screws including the types and lengths of the screws are indicated on the computer body.

Format:

**Screw shape + Screw length (mm)**

Screw shape

B: Bind screw

F: Flat head screw

S: Super thin head screw

T: Tapping screw

U: Other screws (Unique screws: pan head, stud, etc.)

Example: **B6** ... 6mm BIND screw

## 4.2 Battery pack

### Removing the battery pack

The following describes the procedure for removing the battery pack. (See Figure 4-1.)

**Caution:** Take care not to short circuit the terminals when removing the battery pack. Similarly, do not drop, knock, scratch, disassemble, twist, or bend the battery pack.

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all other external devices from the computer.
3. Turn the computer upside down.
4. Release the **battery lock switch**.
5. Pull out the **battery pack** while sliding the **battery latch** toward the arrow pointing.

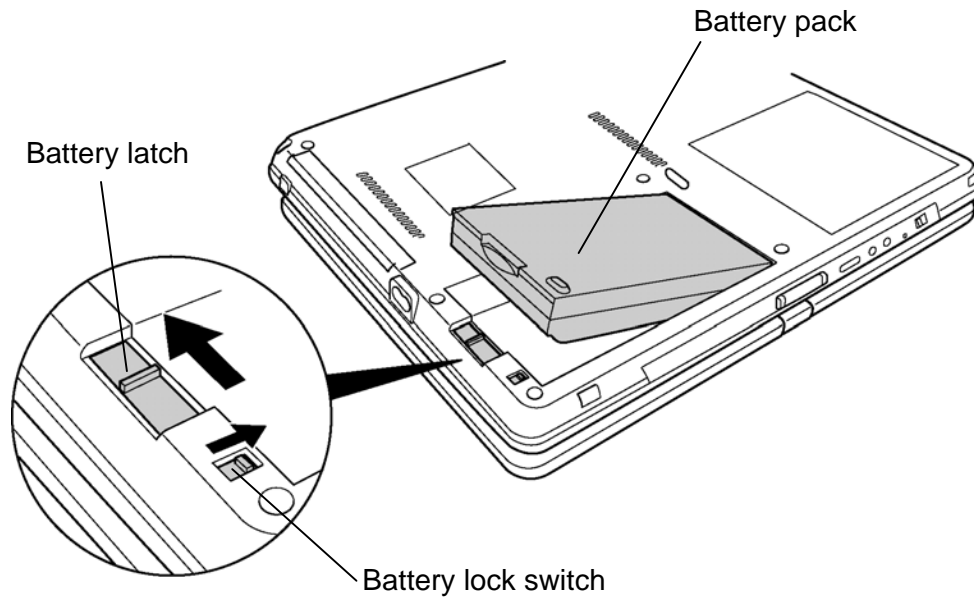


Figure 4-1 Removing the battery pack

**Note:** Dispose of the used battery pack in accordance with the laws and ordinances of your local authority.

## Installing the battery pack

The following describes the procedure for installing the battery pack. (See Figure 4-1.)

**Caution:** *There is a danger that the lithium ion battery pack may explode if not fitted, operated, handled, or disposed correctly. Dispostickerways the used batteries pack in accordance with the laws and ordinances of your local authority. Use only the batteries approved by Toshiba.*

**Note:** *Check visually the battery terminals and clean off any dirt with a dry cloth.*

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all other external devices from the computer.
3. Inset the connector of the battery pack to the connector of the computer. Press the **battery pack** until the battery is locked.
4. Slide the **battery lock** into the lock position.

## 4.3 PC card/SD card

### 4.3.1 PC card

#### Removing the PC card

The following describes the procedure for removing the PC card. (See Figure 4-2.)

**Caution:** Insert or remove the PC card in accordance with any instructions in the PC card manual or the manuals of the computer system you are using.

1. Turn the computer upside down.
2. Push the **ejection button**. It will pop out when you release it. Press it once more to eject the PC card.
3. Pull out the **PC card** and remove it.
4. Push in the ejection button again.

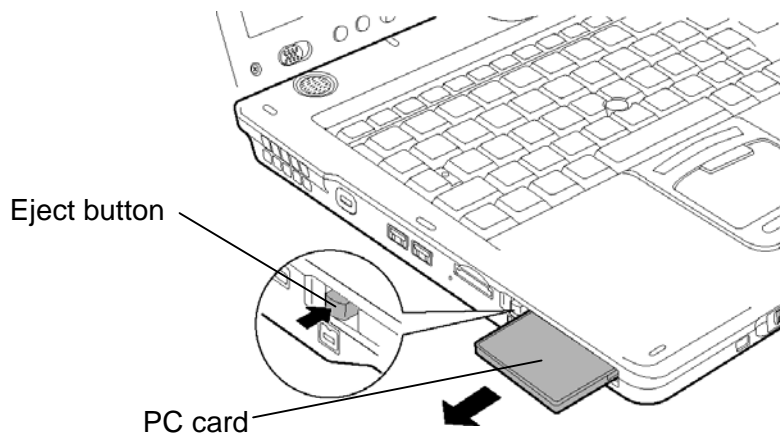


Figure 4-2 Removing the PC card

#### Installing the PC card

The following describes the procedure for installing the PC card. (See Figure 4-2.)

1. Make sure the eject button does not stick out.
2. Insert the **PC card** carefully to ensure a firm connection.



### 4.3.2 SD card

#### Removing the SD card

The following describes the procedure for removing the SD card. (See Figure 4-3.)

**Caution:** Insert or remove the SD card in accordance with any instructions in the SD card manual or the manuals of the computer system you are using.

1. Push the SD card. It will pop out partly when you release, so pull out the card.

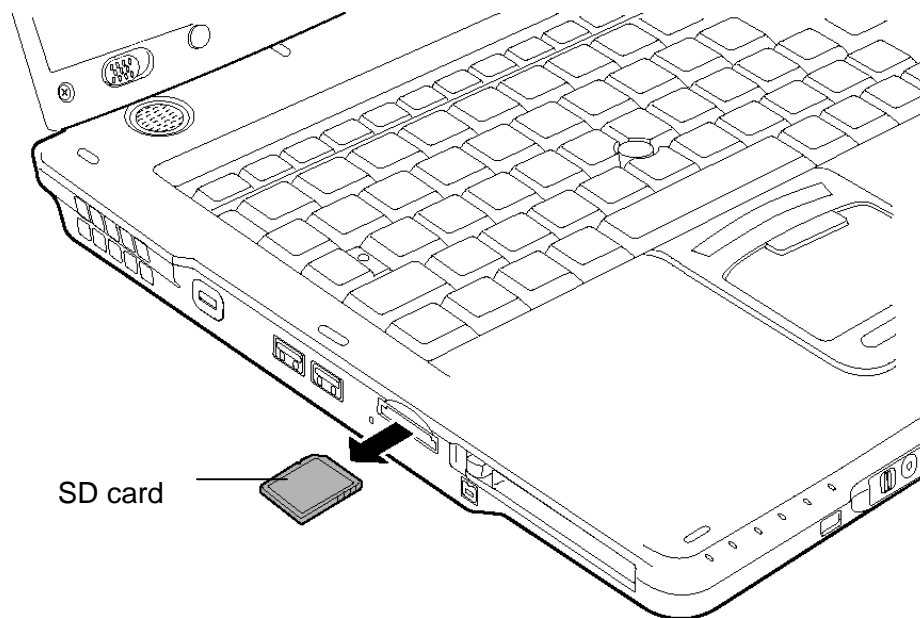


Figure 4-3 Removing the SD card

#### Installing the SD card

The following procedure describes the procedure for installing the SD card. (See Figure 4-3.)

1. Insert the SD card and press it until it securely connected.

## 4.4 Memory module

**Caution:** The power must be turned off when you remove the memory module. Removing the memory module with the power on risks damaging the module or the computer itself.

Do not touch the memory module terminals. Any dirt on the terminals may cause memory access problems.

Never press hard or bend the memory module.

### Removing the memory module

To remove the memory module(s), confirm that the computer is in boot mode. Then perform the following procedure. (See Figure 4-4.)

1. Turn the computer upside down.
2. Loosen the **screw** (with e-ring) fixing the memory slot cover.
3. Remove the **memory slot cover**.
4. Open the left and right **latches** and remove the **memory module(s)**.

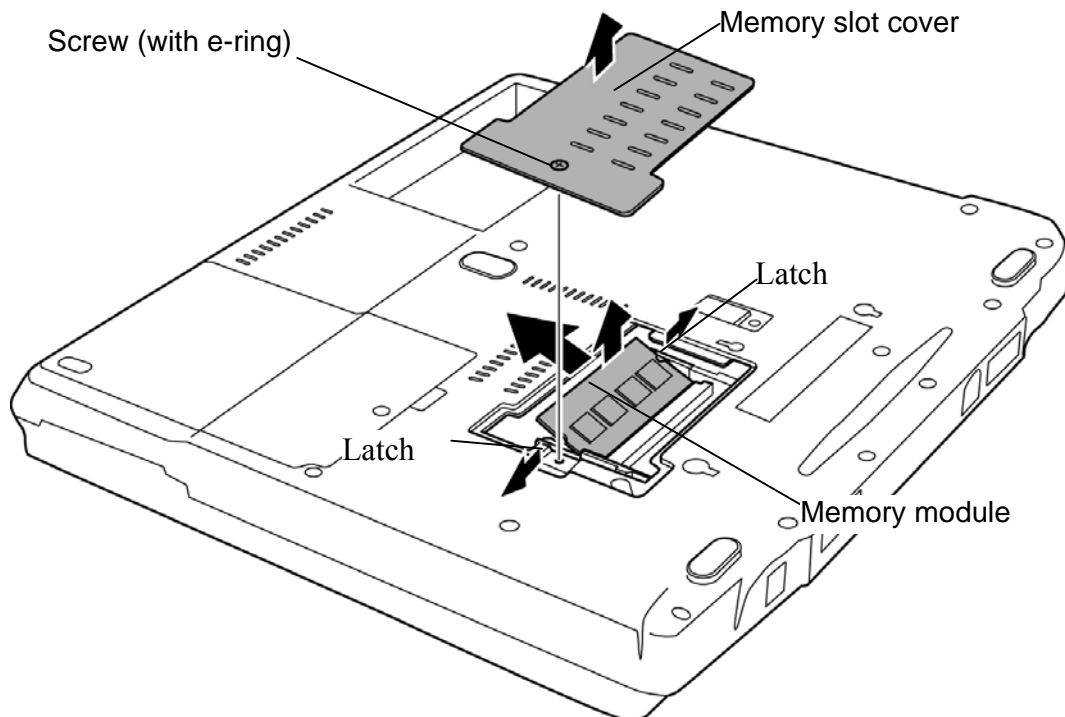


Figure 4-4 Removing the memory module

### Installing the memory module

To install the memory module(s), confirm that the computer is in boot mode. Then perform the following procedure. (See Figure 4-4.)

1. Insert the **memory module** into the connector of the computer slantwise (terminal side first) and press it to connect firmly.

**Caution:** *The power must be turned off when you insert the memory module. Inserting the memory module with the power on risks damaging the module or the computer itself.*

*Never press hard or bend the memory module.*

*When installing the memory module, be careful not to insert the memory module into the expansion memory slot (inner slot).*

2. Install the **memory slot cover**.
3. Secure the **screw** (with e-ring) to fix the memory slot cover.

## 4.5 HDD

### Removing the HDD

The following describes the procedure for removing the HDD. (See Figure 4-5 and 4-6.)

**Caution:** Take care not to press on the top or bottom of the HDD. Pressure may cause data loss or damage to the device.

1. Turn the computer upside down.
2. Loosen the **screw** (with e-ring) fixing the HDD slot cover and remove the **HDD slot cover**.
3. Pull out the **HDD assembly** from the connector **CN1900** of HDD cable.

**Note:** When removing the HDD assembly, be careful not to tear the laminate. If the laminate is torn, replace it with a new one.

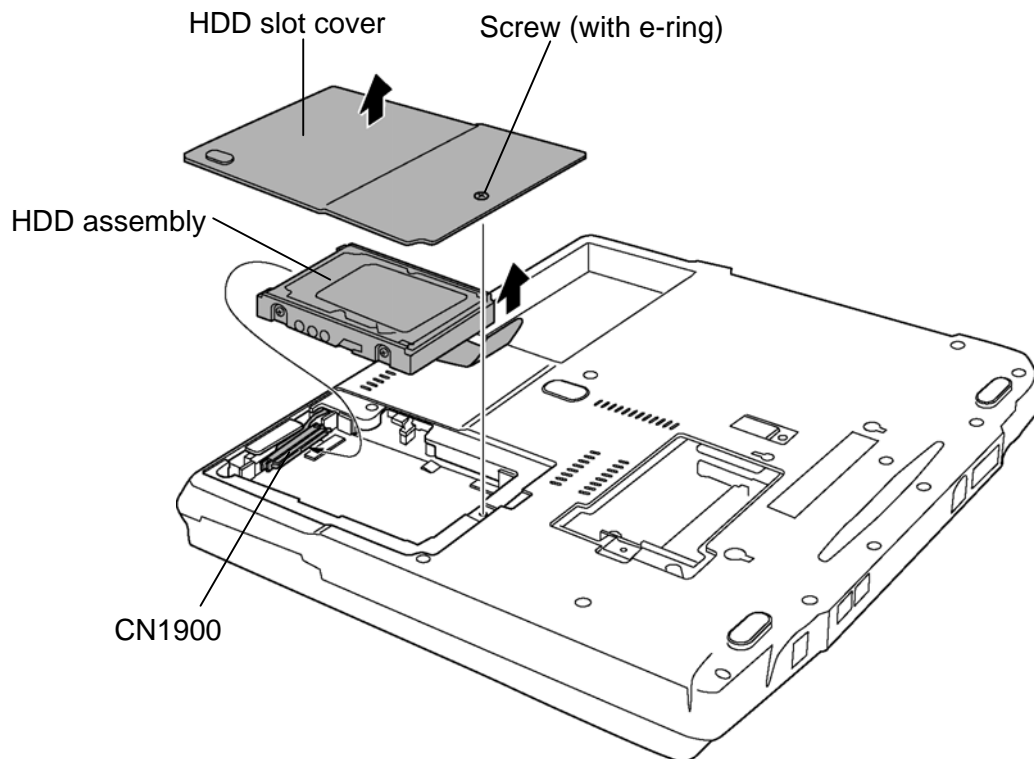


Figure 4-5 Removing the HDD FPC

4. Remove the following **screws** fixing the HDD holder.

- M3.0x4.0S FLAT BIND screw x4

5. Detach the **HDD holder** from the **HDD**.

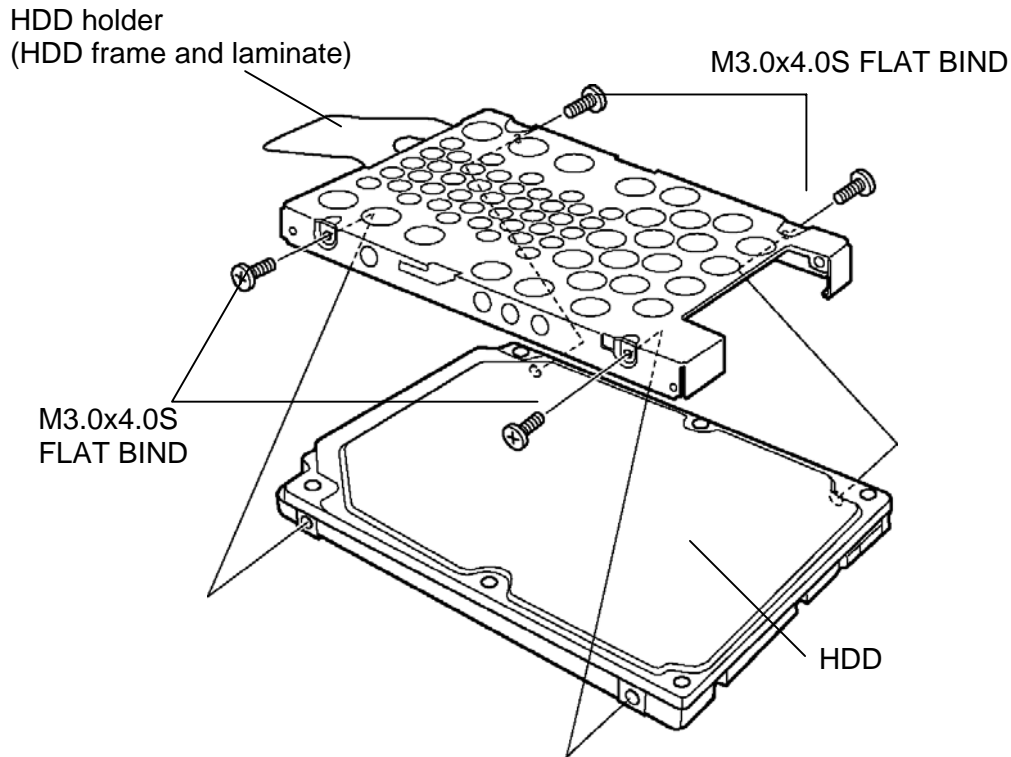


Figure 4-6 Removing the HDD holder

### Installing the HDD

The following describes the procedure for installing the HDD. (See Figure 4-5 and 4-6.)

**CAUTION:** HDD frame and laminate can not be reused. If you detach the laminate package from HDD frame, be sure to use a new HDD frame and laminate package when replacing.

1. Install the **HDD holder** to the **HDD** and secure it with the following **screws**.

- M3.0x4.0S FLAT BIND screw x4

2. Connect the **HDD** to the connector **CN1900** of the HDD cable.

3. Insert the **HDD assembly** into the HDD slot of computer.

4. Install the **HDD slot cover** and secure it with the **screw** (with e-ring).

## 4.6 Selectable bay module

### Removing the selectable bay module

The following describes the procedure for removing the selectable bay module. (See Figure 4-7 and 4-8.)

1. Turn the computer upside down.
2. Move the following **screw** (if the screw is secured in the lock screw hole) from **lock position** to **unlock position**.
  - M2.5x4.0B FLAT BIND screw x1
3. Pull out the selectable bay module from the selectable bay while sliding the **lever**.

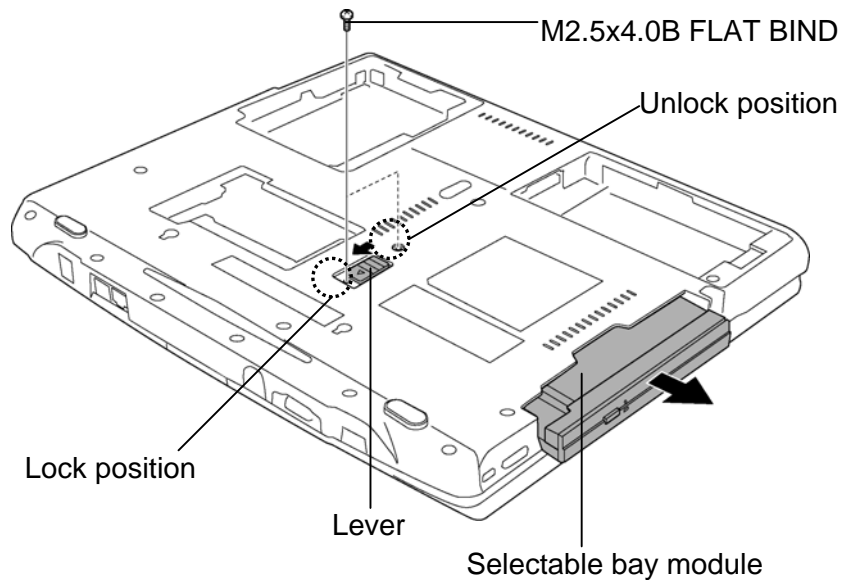


Figure 4-7 Removing the selectable bay module

4. Remove the following **screws** securing the **plastic brace** and the **OD board** and remove them.

- M2.0x8.0S BIND screw x2

5. Remove the following **screws** securing the **plastic frame** and remove it.

- M2.0x3.0S S-THIN FLAT BIND screw x5

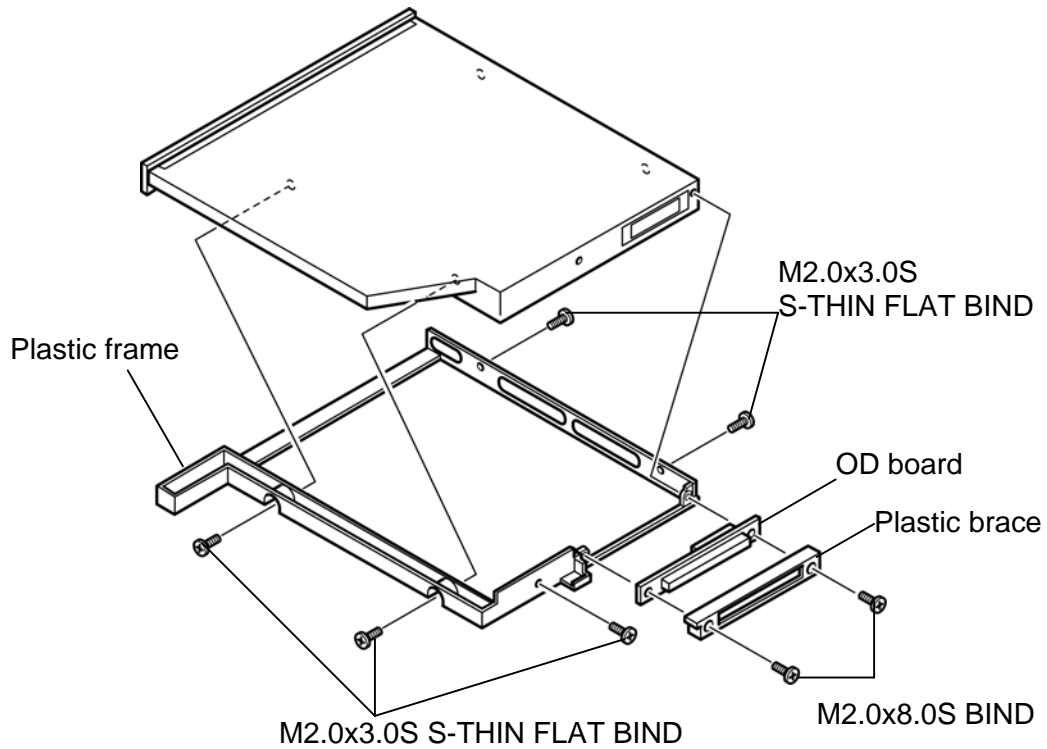


Figure 4-8 Removing the plastic frame

### Installing the selectable bay module

The following describes the procedure for installing the selectable bay module. (See Figure 4-7 and 4-8.)

1. Install the **plastic frame** to the selectable bay module and secure them with following **screws**.
  - M2.0x3.0S S-THIN FLAT BIND screw x5
2. Install the **OD board** and **plastic brace** to the selectable bay module and secure them with following screws.
  - M2.0x8.0S BIND screw x2
3. Insert the selectable bay module into the selectable bay of the computer.
4. Turn the following **screw** (if you want to lock the selectable bay) from **unlock position** to **lock position**.
  - M2.5x4.0B FLAT BIND screw x1



## 4.7 Keyboard

### Removing the keyboard

The following describes the procedure for removing the keyboard. (See Figure 4-9.)

1. Turn the computer face up.
2. Open the display.
3. Insert your nails in the slot of both sides of the **keyboard holder** and lift it up.
4. Remove the following **screws** securing the keyboard.
  - M2.5x2.8B FLAT BIND screw x2
5. Lift the top edge of the keyboard and bring the edge to the front to lay on the computer. Unlock the connector and disconnect the **keyboard flexible cable** from the connector **CN3230** on the system board.
6. Remove the **keyboard**.

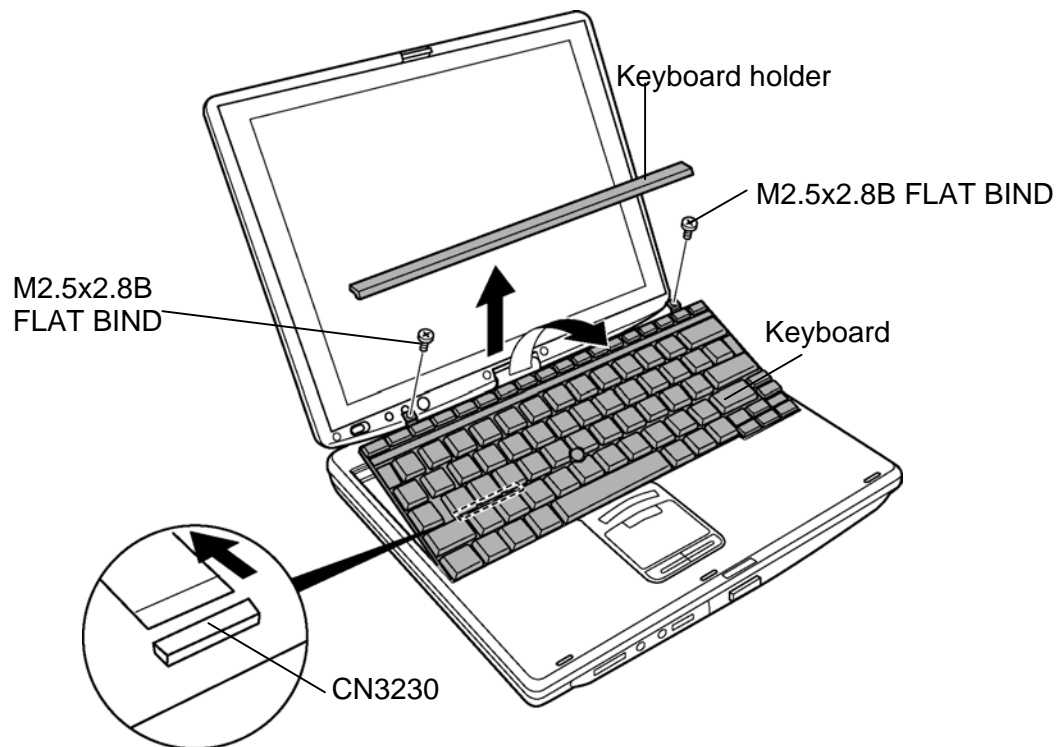


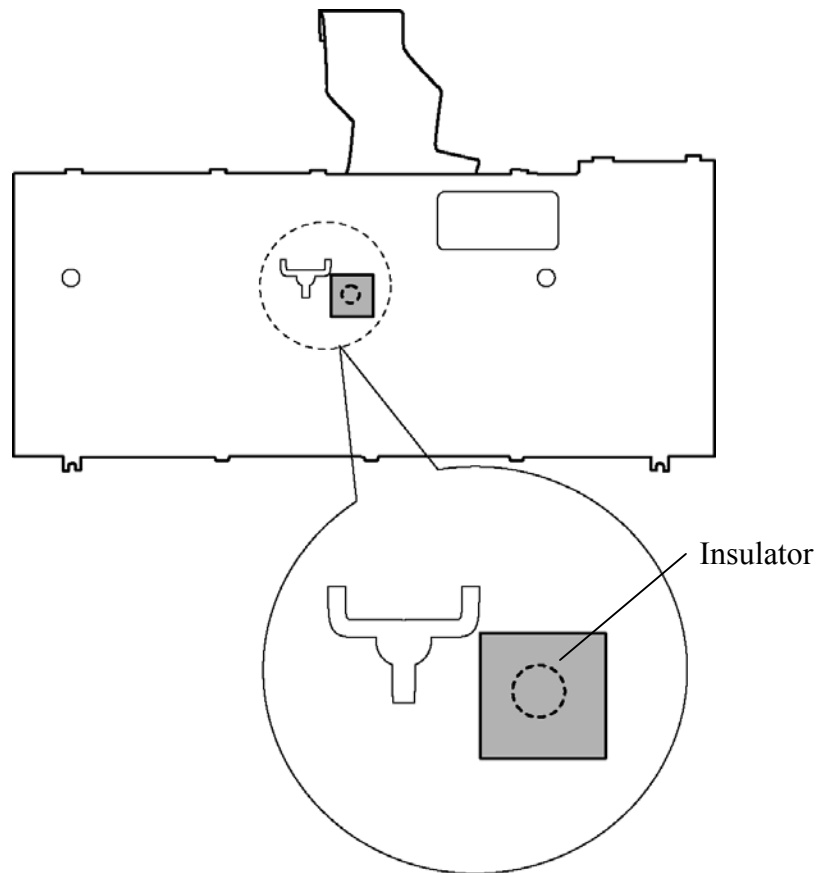
Figure 4-9 Removing the keyboard

## Installing the keyboard

The following describes the procedure for installing the keyboard. (See Figure 4-9.)

1. Put the keyboard on the palm rest as its face is down. Connect **the keyboard flexible cable** to **CN3230** on the system board and lock the connector.

**Caution:** 1. When replacing the keyboard with new one, adhere a sheet of insulator to the back of keyboard in the position shown in the following figure.  
2. Do not reuse the insulator adhered on the keyboard. Be sure to use new one.



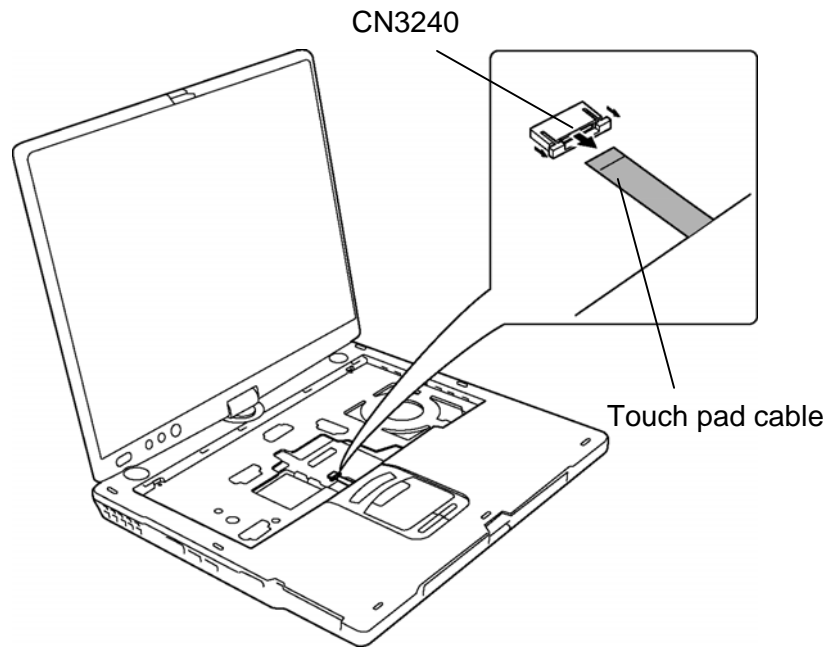
2. Hook the bottom edge of the keyboard to the palm rest. Place the **keyboard** on the computer and secure it with the following **screws**.
  - M2.5x2.8B FLAT BIND screw x2
3. Fit to install the **keyboard holder**.

## 4.8 Bottom cover assembly

### Removing the bottom cover assembly

The following describes the procedure for removing the bottom cover assembly. (See Figure 4-10 and 4-11.)

1. Disconnect the **touch pad cable** from the connector **CN3240** on the system board.



*Figure 4-10 Removing the touch pad cable*

2. Close the display and turn the computer upside down.
3. Remove the following **screws** securing the bottom cover assembly.
  - M2.0x6.0B FLAT BIND screw x20 (Described as (6) in figure)
  - M2.0x4.0B FLAT BIND screw x2 (Described as (4) in figure)
4. Pull up to remove the **bottom cover assembly** from the computer.

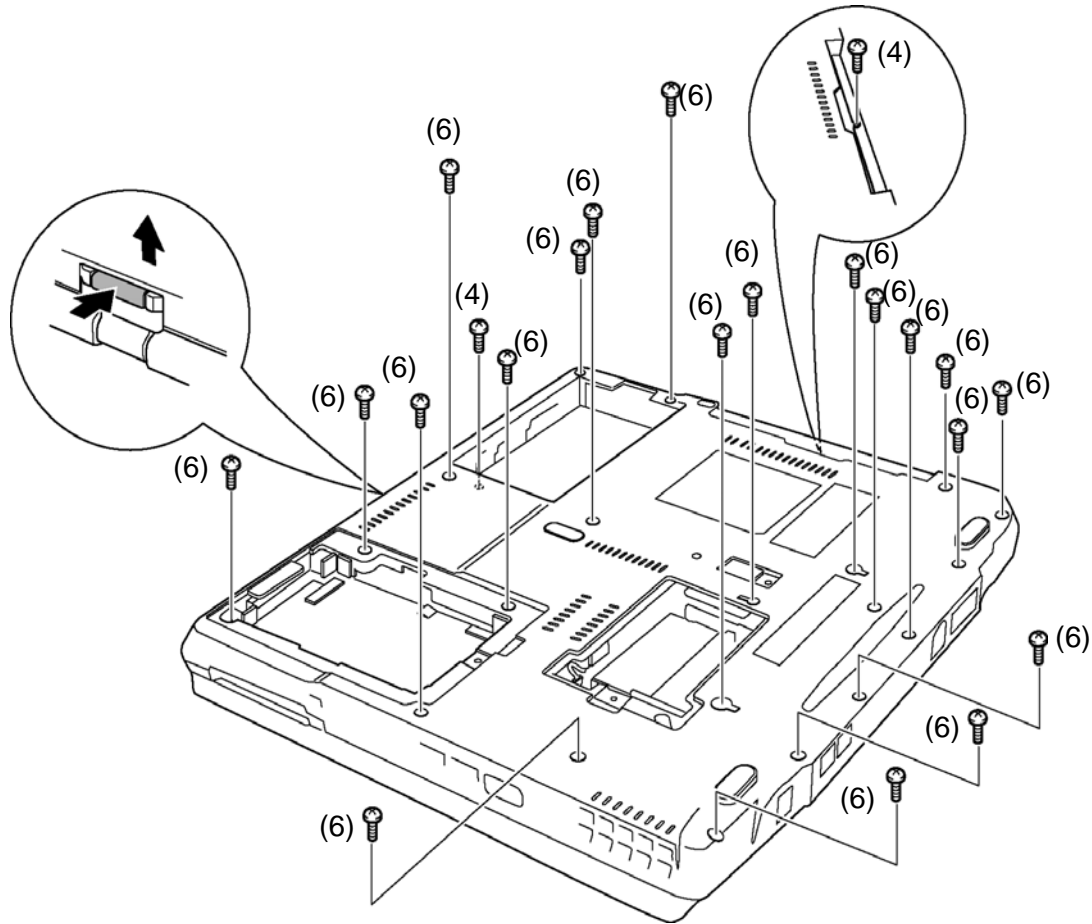


Figure 4-11 Removing the bottom cover assembly

### Installing the bottom cover assembly

The following describes the procedure for installing the bottom cover assembly. (See Figure 4-10 and 4-11.)

1. Install the **bottom cover assembly** to the computer.

**Note:** Install the bottom cover assembly from the *i.LINK (IEEE1394)* slot first.

2. Secure the bottom cover assembly with the following screws
  - M2.0x6.0B FLAT BIND screw x20 (Described as (6) in figure)
  - M2.0x4.0B S-THIN FLAT BIND screw x2 (Described as (4) in figure)
3. Turn over the computer and open the display.
4. Connect the **touch pad cable** to the connector **CN3240** on the system board.

## 4.9 Battery latch assembly / Selectable bay lock

### 4.9.1 Battery latch assembly

#### Removing the battery latch assembly

The following describes the procedure for removing the battery latch assembly. (See Figure 4-12.)

1. Remove the following **screw** securing the battery latch assembly.
  - M2.5x4.0B FLAT BIND screw x1
2. Pull up to remove the **battery latch assembly** from the bottom cover assembly.

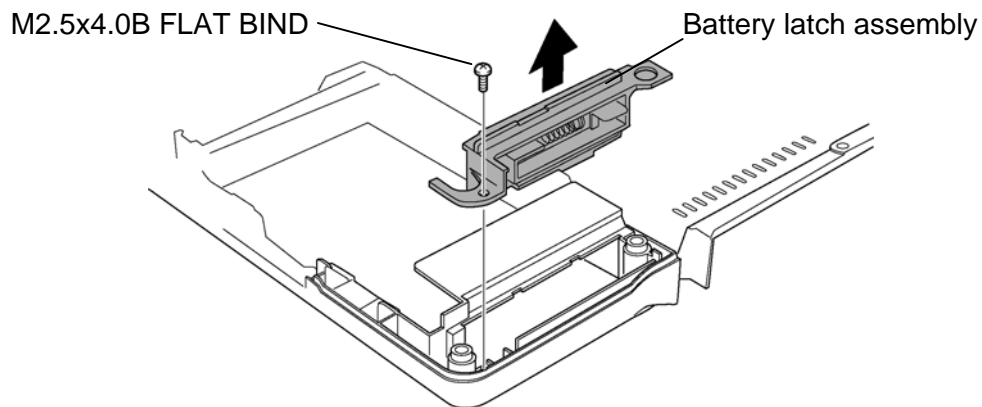


Figure 4-12 Removing the battery latch assembly

#### Installing the battery latch assembly

The following describes the procedure for installing the battery latch assembly. (See Figure 4-12.)

1. Install the **battery latch assembly** to the bottom cover assembly.
2. Secure the battery latch assembly with the following **screw**.
  - M2.5x4.0B FLAT BIND screw x1

## 4.9.2 Selectable bay lock

### Removing the Selectable bay lock

The following describes the procedure for removing the selectable bay lock. (See Figure 4-13.)

1. Release the **tabs** (2 points) and detach the **Selectable bay lock A**.
2. Remove the **Selectable bay lock B** from the bottom cover assembly.

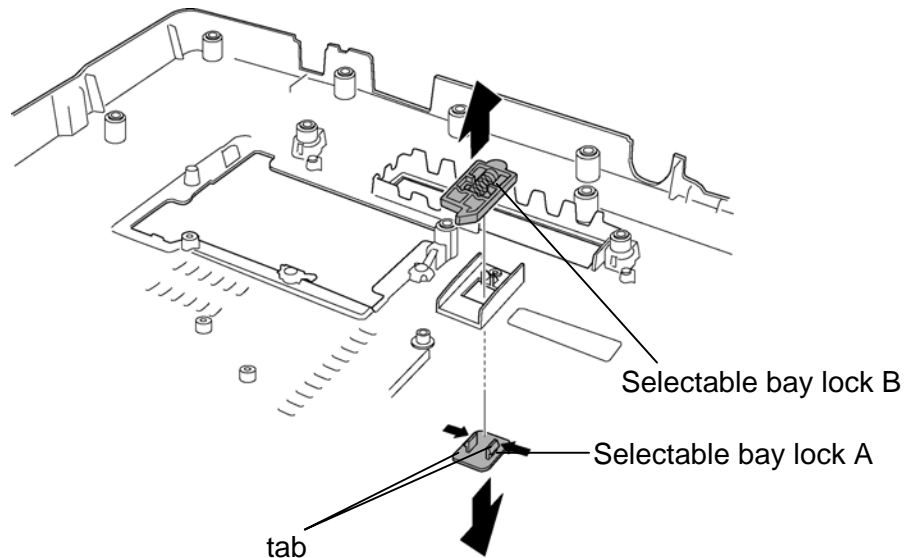


Figure 4-13 Removing the selectable bay lock

### Installing the selectable bay lock

The following describes the procedure for installing the selectable bay lock. (See Figure 4-13.)

1. Install the **Selectable bay lock B** to the bottom cover assembly and **Selectable bay lock A** from the back, then hook the **tabs** (2 points).

**Caution:** Selectable bay lock has different shapes of tabs for each side (2 points).  
Therefore, be sure to fit their shapes for installation.

## 4.10 QI button assembly / PC card slot brace

### 4.10.1 QI button assembly

#### Removing the QI button assembly

The following describes the procedure for removing the QI button assembly. (See Figure 4-14.)

1. Remove the following **screw** securing the QI button assembly and remove the **QI button assembly**.

- M2.5x4.0B FLAT BIND screw x1

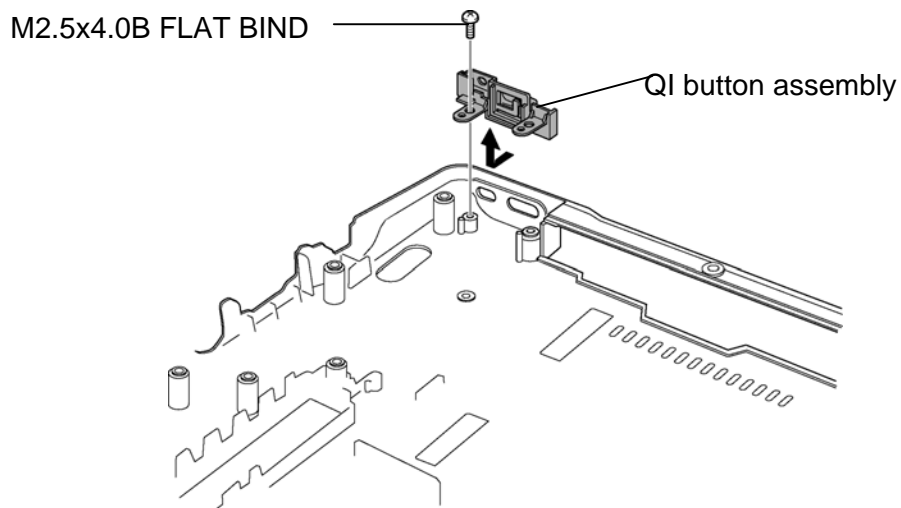


Figure 4-14 Removing the QI button assembly

#### Installing the QI button assembly

The following describes the procedure for installing the QI button assembly. (See Figure 4-14.)

1. Install the **QI button assembly** to the slot of bottom cover assembly and secure it with the following **screw**.

- M2.5x4.0B FLAT BIND screw x1

**Note:** When installing the QI button assembly, be sure to fit the button portion to the slot of bottom cover assembly.

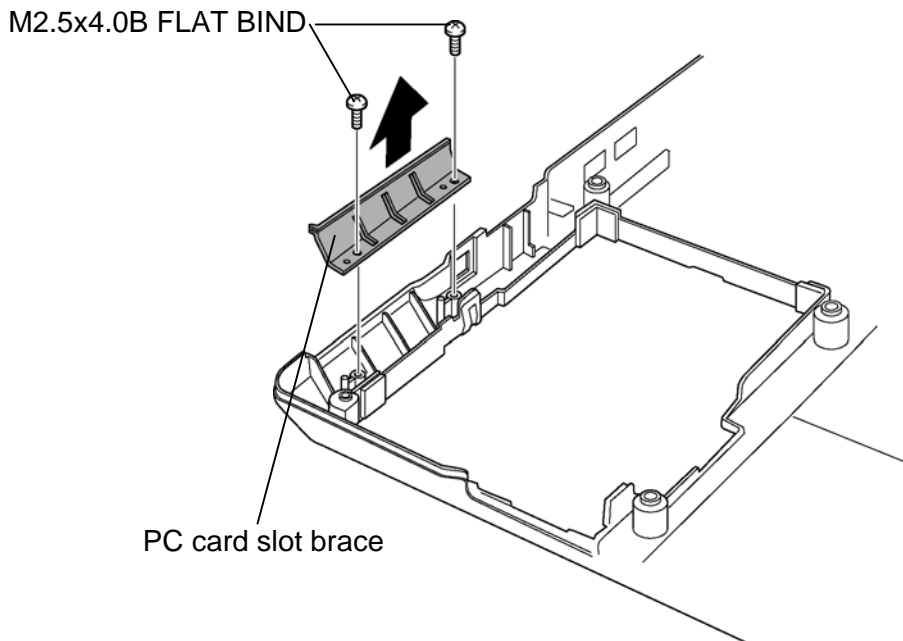
### 4.10.2 PC card slot brace

#### Removing the PC card slot brace

The following describes the procedure for removing the PC card slot brace. (See Figure 4-15.)

1. Remove the following **screws** securing the PC card slot brace and remove the **PC card slot brace**.

- M2.5x4.0B FLAT BIND screw x2



*Figure 4-15 Removing the PC card slot brace*

#### Installing the PC card slot brace

The following describes the procedure for installing the PC card slot brace. (See Figure 4-15.)

1. Install the **PC card slot brace** to the bottom cover assembly.
2. Secure the PC card slot brace with the following **screws**.

- M2.5x4.0B FLAT BIND screw x2



## 4.11 Bluetooth module

### Removing the Bluetooth module

To remove the Bluetooth module, follow the steps below. (See Figure 4-16.)

**CAUTION:** Do not try to remove the Bluetooth module with the computer turned on. You can damage the computer or Bluetooth module. Do not touch the connectors on the Bluetooth module on the computer. Debris on the connectors may cause Bluetooth access problems.

1. Remove the following **screw** to remove the **Bluetooth module**.
  - M2×3S S-FLAT HEAD screw ×1
2. Disconnect the **Bluetooth cable (black)** from the Bluetooth module using an antenna coaxial cable disconnecter.
3. Disconnect the **flexible cable** from the Bluetooth module.

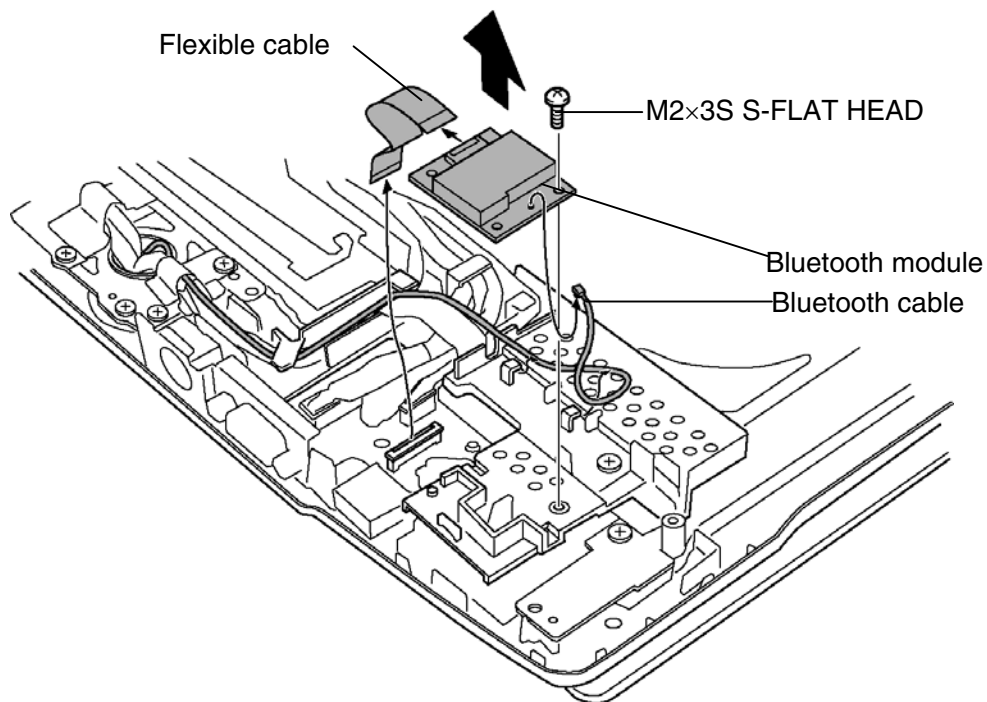


Figure4-16 Removing the Bluetooth module

**Installing the Bluetooth module**

To install the Bluetooth module, follow the steps below. (See Figure 4-16.)

1. Connect the **flexible cable** to the **Bluetooth module**.
2. Connect the **Bluetooth cable (black)** to the Bluetooth module.
3. Secure the Bluetooth module with the following **screw**.

- M2×3S S-FLAT HEAD screw ×1

## 4.12 MDC / Modem cable

### Removing the MDC / Modem cable

The following describes the procedure for removing the MDC / Modem cable. (See Figure 4-17 and 4-18.)

1. Remove the following **screws** securing the MDC.
  - M2.0x4.0Z BIND screw x2
2. Pull up the **MDC** straight and remove it from the connector **CN3000** on the system board.
3. Disconnect the **Modem cable** from the connector of MDC.

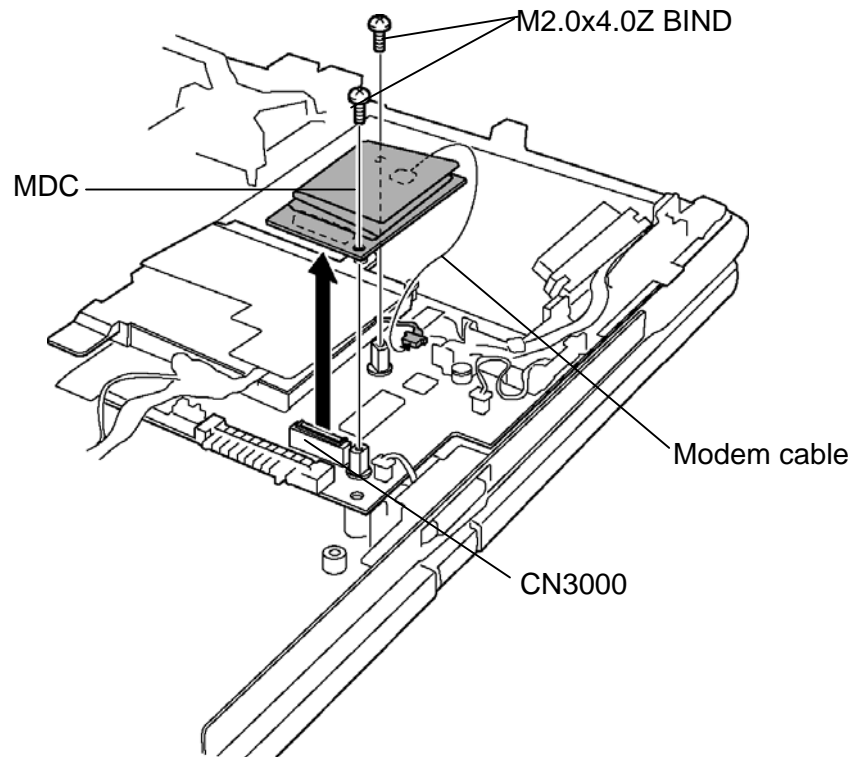


Figure 4-17 Removing the MDC

4. Pull out the Modem cable from the guide of mini PCI cover.

5. Remove the following **screw** and disconnect the **drain cable 1** from the stud of system board.
  - M2.0x4.0Z BIND screw x1
  - or
  - M2.0x4.0B LH STICK x1
6. Peel off the **glass tape** and open the **insulators** and pull out the Modem cable from the insulators.
7. Remove the following **screw** and disconnect the **drain cable 2** from the stud of hinge assembly.
  - M2.0x4.0Z BIND screw x1
8. Disconnect and remove the **Modem cable** from the connector **CN3001** on the system board.

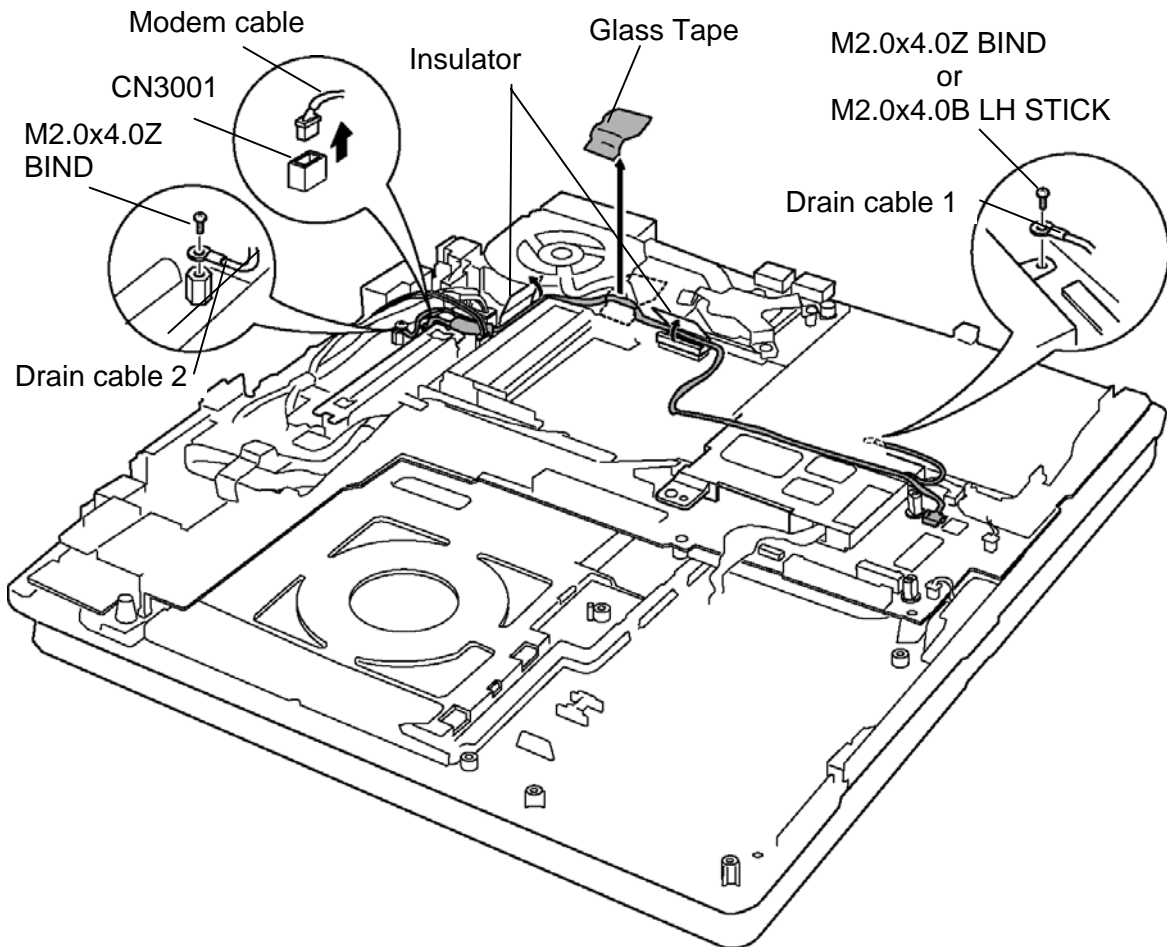


Figure 4-18 Removing the Modem cable

**Installing the MDC / Modem cable**

The following describes the procedure for installing an MDC / Modem cable. (See Figure 4-17 and 4-18.)

1. Connect the **Modem cable** to the connector **CN3001** on the system board.
2. Secure the **drain cable 2** to the stud of hinge assembly with the following **screw**.
  - M2.0x4.0Z BIND screw x1
3. Arrange the Modem cable inside the **insulators** and close the insulators.
4. Arrange the Modem cable along the guide of mini PCI cover.
5. Secure the **drain cable 1** to the stud of system board with the following **screw**.
  - M2.0x4.0Z BIND screw x1
  - or
  - M2.0x4.0B LH STICK x1
6. Connect the Modem cable to the connector of MDC.
7. Install the **MDC** to the connector **CN3000** on the system board and secure it with the following **screws**.
  - M2.0x4.0Z BIND screw x2
8. Stick the glass tape on the Modem cable.

## 4.13 Wireless LAN card

### Removing the Wireless LAN card

The following describes the procedure for removing the Wireless LAN card. (See Figure 4-19.)

1. Disconnect the **speaker cable** from the connector **CN6150** on the system board and pull out the cable from the guide of mini PCI cover.
2. Remove the following **screws** securing the mini PCI cover and remove the **mini PCI cover**.
  - M2.0x4.0Z BIND screw x1
3. Disconnect the **wireless LAN antenna cables** from the connectors on the wireless LAN card.
4. Open the left and right latches securing the wireless LAN card and remove the **wireless LAN card** from the connector of mini PCI.

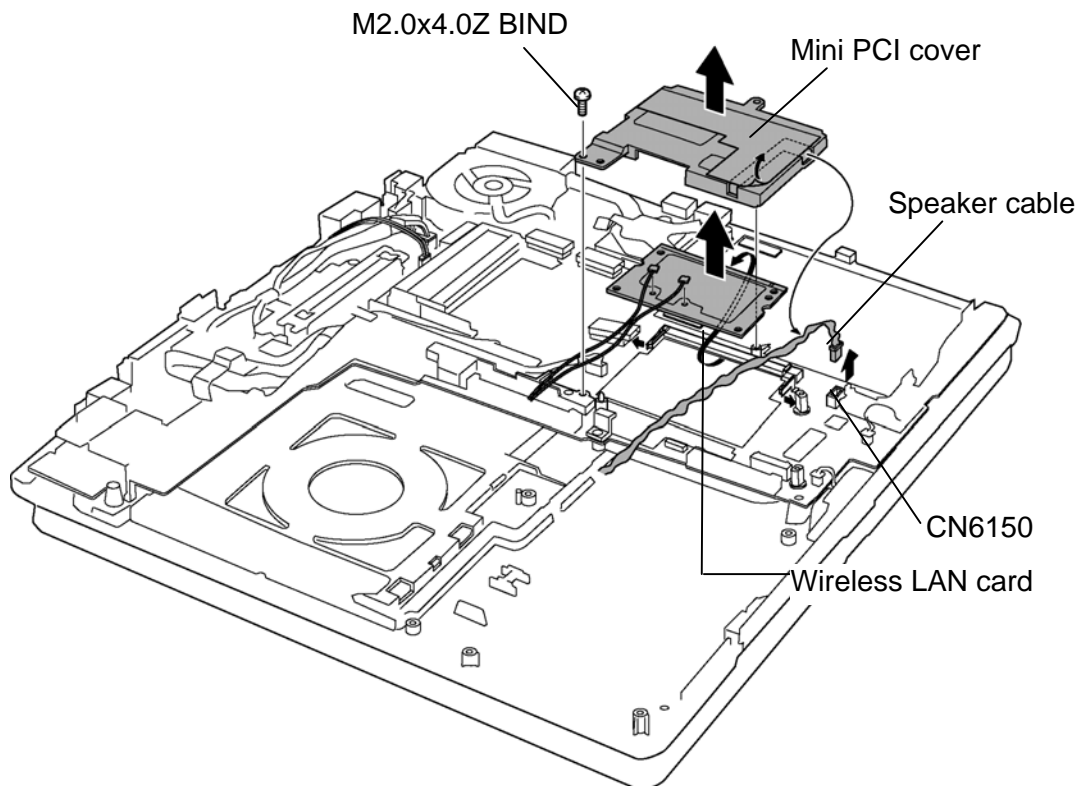


Figure 4-19 Removing the Wireless LAN card

### Installing the Wireless LAN card

The following describes the procedure for removing the wireless LAN card. (See Figure 4-19.)

1. Insert the **wireless LAN card** slantwise into the connector of mini PCI. Press the wireless LAN card until it hooks surely.
2. Connect the **wireless LAN antenna cables** to the connectors of wireless LAN card. (White cable to MAIN connector, Black cable to AUX connector)
3. Secure the mini PCI cover with the following **screws**.
  - M2.0x4.0Z BIND screw x1
4. Arrange the **speaker cable** along the guide of mini PCI cover and connect the speaker cable to the connector **CN6150** on the system board.

## 4.14 Fan/CPU

### 4.14.1 Fan (Fan0 / Fan1)

#### Removing the Fan0 / Fan1

The following describes the procedure for removing the fan. (See Figure 4-20.)

1. Disconnect the fan cable from the connector **CN8770** (for fan0)/**CN8780** (for fan1) on the system board.
2. Remove the following **screws** securing the fan and remove the **Fan0 / Fan1**.
  - M2.5x4.0B FLAT BIND screw x2 (each)

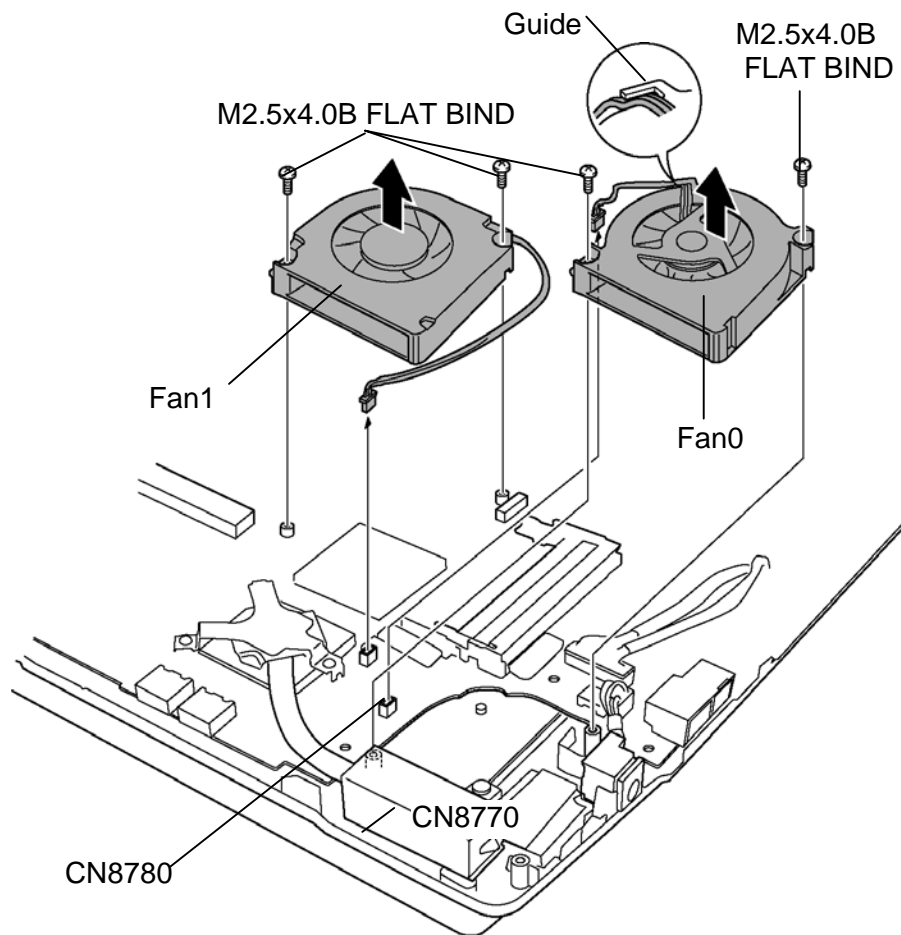


Figure 4-20 Removing the fan



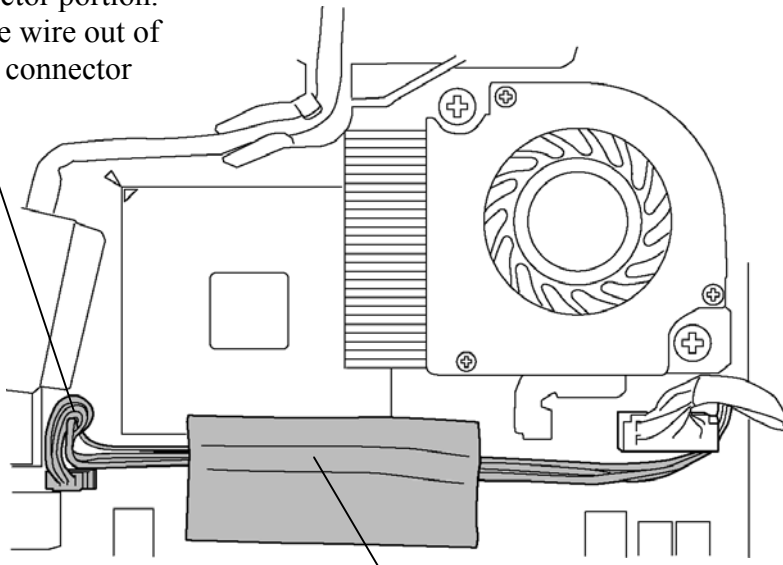
## Installing the Fan0 / Fan1

The following describes the procedure for installing the fan. (See Figure 4-20.)

1. Install the fan while fitting the screw holes and secure it with the following **screws**.
  - M2.5x4.0B FLAT BIND screw x2 (each)
2. Hook the **fan cable** to the guide and connect it to the connector **CN8770** (for Fan0)/**CN8780** (for Fan1) on the system board.

**Caution:** When laying the fan cable, be careful on the points shown in the following figure.

Bring the remaining cable to the connector portion.  
Do not let the wire out of the memory connector side.



Fix the cables with a glass tape so that they could not be on top of each other.

## 4.14.2 CPU

### Removing the CPU

The following describes the procedure for removing the CPU. (See Figure 4-21 and 4-22.)

1. Remove the following **screws** securing the CPU hold plate in the reverse order of the number (3→1) on the CPU hold plate and remove the **CPU hold plate**.

- M2.0x4.0B BIND screw x3

2. Remove the **heat sink** on the CPU.

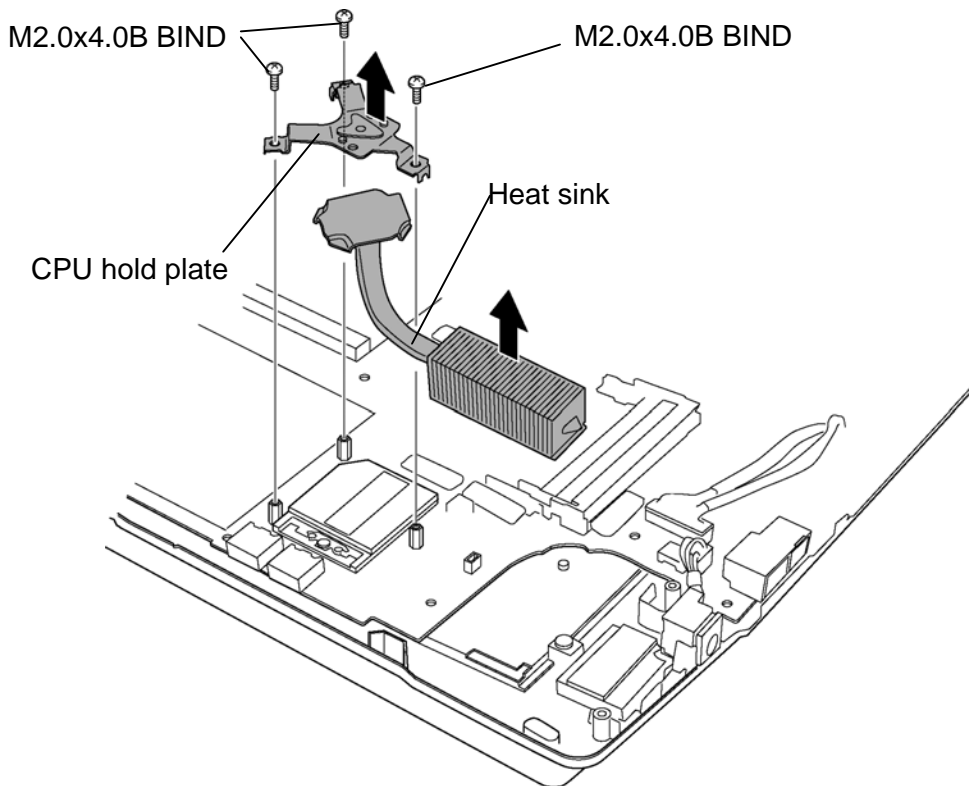


Figure 4-21 Removing the heat sink

3. Unlock the CPU by rotating counterclockwise the cam on the CPU socket by 180 degrees with a flat-blade driver.

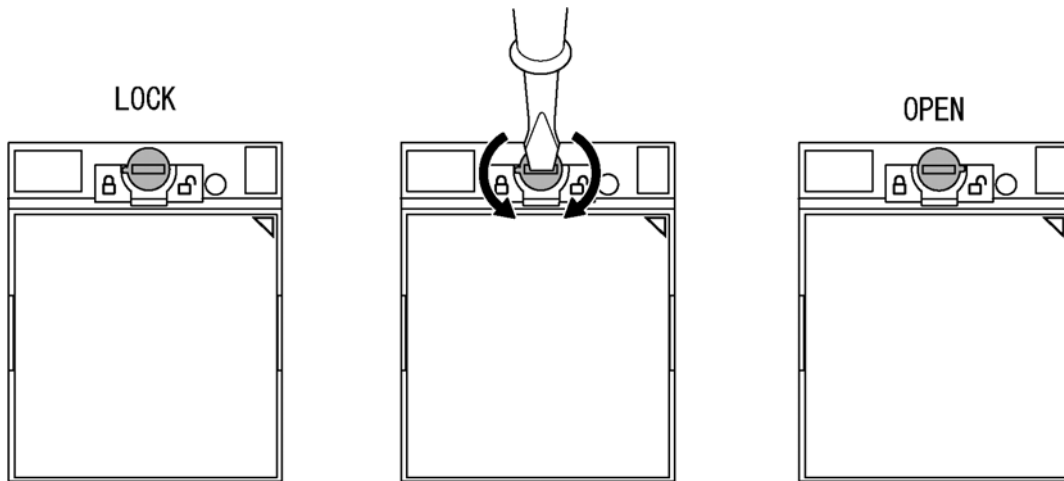


Figure 4-22 Removing the CPU

4. Remove the **CPU**.

### Installing the CPU

The following describes the procedure for installing the CPU. (See Figure 4-21 to 4-23.)

1. Make sure that the cam of the CPU socket is in the unlock (OPEN) position.
2. Install the CPU on the CPU socket and check the CPU is installed on the right position.
3. Lock the CPU by rotating clockwise the cam on the CPU socket by 180 degrees with a flat-blade driver.

4. If there is already silicon grease on the CPU and FIN, clean it with a cloth. Using a special applicator, apply silicon grease so that the CPU chip on the CPU is completely covered.

**Note:** Apply the silicon grease enough to cover the chip surface using the special applicator.

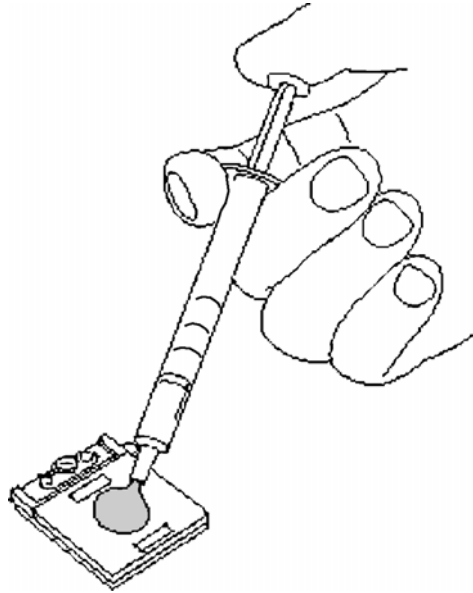


Figure 4-23 Applying silicon grease

5. Install the heat sink on the CPU.
6. Install the CPU hold plate and secure it with the following screws in the order of the number (1→3) on the CPU hold plate.
  - M2.0x4.0B BIND screw x3

## 4.15 DC-IN jack

### Removing the DC-IN jack

The following describes the procedure for removing the DC-IN jack. (See Figure 4-24.)

1. Pull up the **DC-IN jack** straight from the slot of cover assembly.
2. Disconnect the DC-IN jack from the connector **CN8800** on the system board

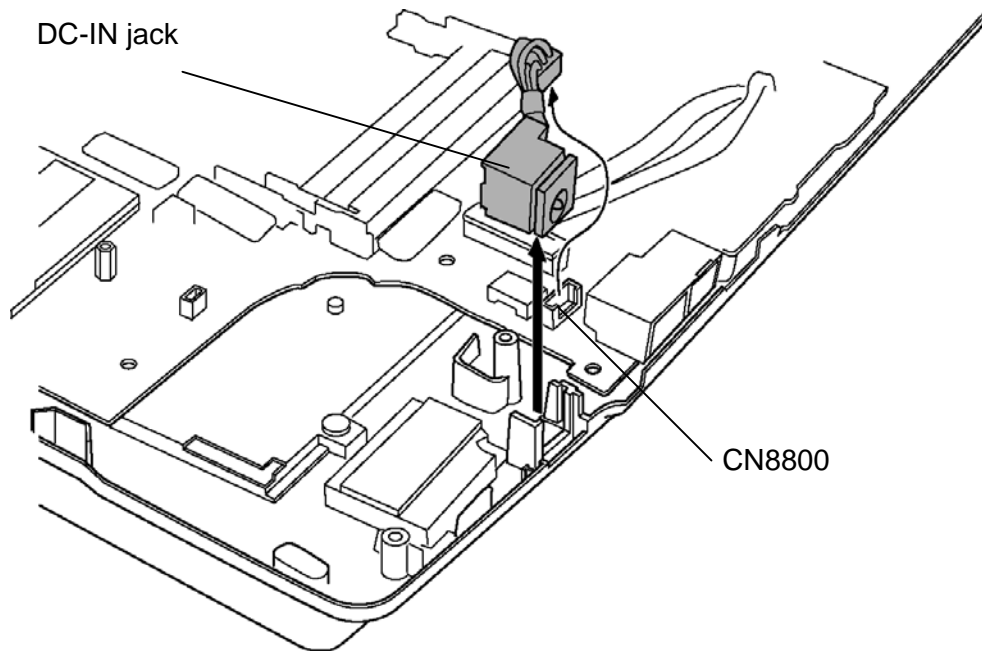


Figure 4-24 Removing the DC-IN jack

### Installing the DC-IN jack

The following describes the procedure for installing the DC-IN jack. (See Figure 4-24.)

1. Connect the DC-IN jack to the connector **CN8800** on the system board.
2. Install the **DC-IN jack** by fitting guide of slot of cover assembly.

## 4.16 Penholder / RTC battery

### 4.16.1 Penholder

#### Removing the Penholder

The following describes the procedure for removing the Penholder. (See Figure 4-25.)

1. Disconnect the **RTC batter cable** from the connector **CN9990** on the system board.
2. Remove the following **screws** securing the Penholder and remove the **Penholder** from the cover assembly.
  - M2.0x4.0B FLAT BIND screw x2

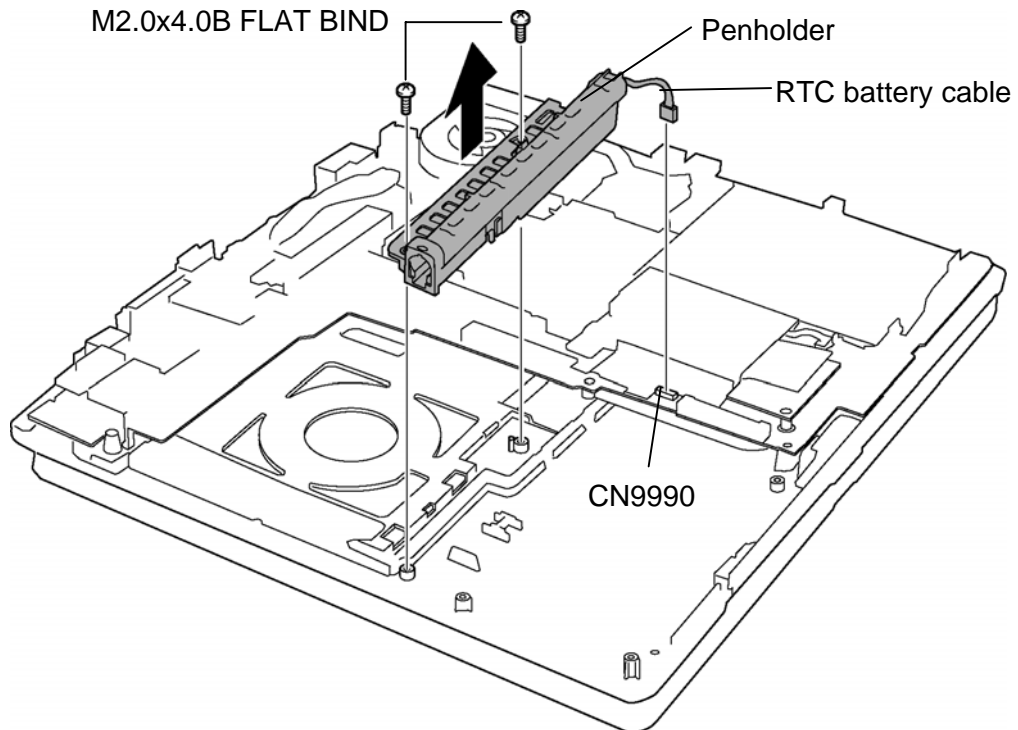


Figure 4-25 Removing the Penholder

## Installing the Penholder

The following describes the procedure for installing the Penholder. (See Figure 4-25.)

1. Install the **Penholder** to the cover assembly and secure it with the following **screws**.
  - M2.0x4.0B FLAT BIND screw x2

**Caution:** When installing the Penholder, be careful not to catch the wireless LAN antenna cables and speaker cable arranged on the cover assembly.

2. Connect the **RTC batter cable** to the connector **CN9990** on the system board.

### 4.16.2 RTC battery

#### Removing the RTC battery

The following describes the procedure for removing the RTC battery. (See Figure 4-26.)

1. Pull out the **RTC batter cable** from the guide of Penholder.
2. Remove the **RTC battery** from the slot of Penholder.

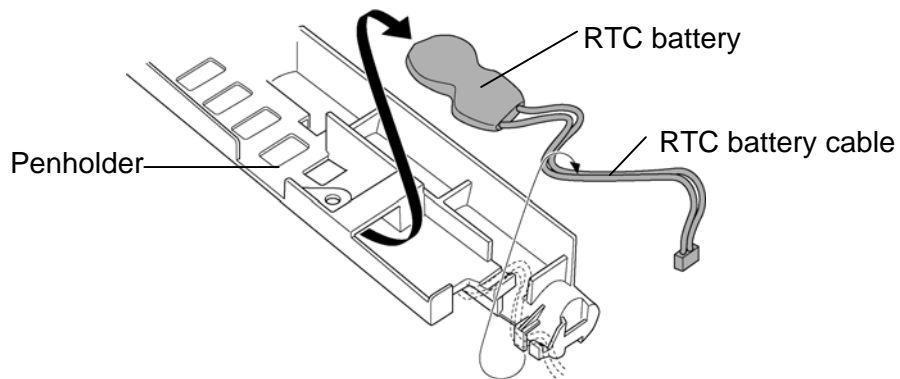


Figure 4-26 Removing the RTC battery

#### Installing the RTC battery

The following describes the procedure for installing the RTC battery. (See Figure 4-26.)

1. Install the **RTC battery** to the slot of Penholder.
2. Arrange the **RTC battery cable** to the guide of Penholder.

## 4.17 LCD harness holder

### Removing the LCD harness holder

The following describes the procedure for removing the LCD harness holder. (See Figure 4-27.)

1. Disconnecting the **USB harness** from the connector **CN4612** on the system board and from **CN4621** on the CN board, turn up the **insulator** and pull out the USB harness from the guide of LCD harness holder.
2. Disconnect the **LCD harness** from the connector **CN5501** on the system board and pull out the LCD harness from the LCD harness holder.
3. Disconnecting the **CN board harness** from the connector **CN9502** on the system board and from the connector **CN9520** on the CN board, pull out the CN board harness from the guide of LCD harness holder.
4. Disconnecting the **QI board cable** from the connector **CN9521** on the CN board and from the connector **CN9530** on the QI board, pull out the QI board cable from the guide of LCD harness holder.



5. Remove the following **screws** securing and remove the **LCD harness holder**.

- M2.5x6.0B FLAT BIND screw x2

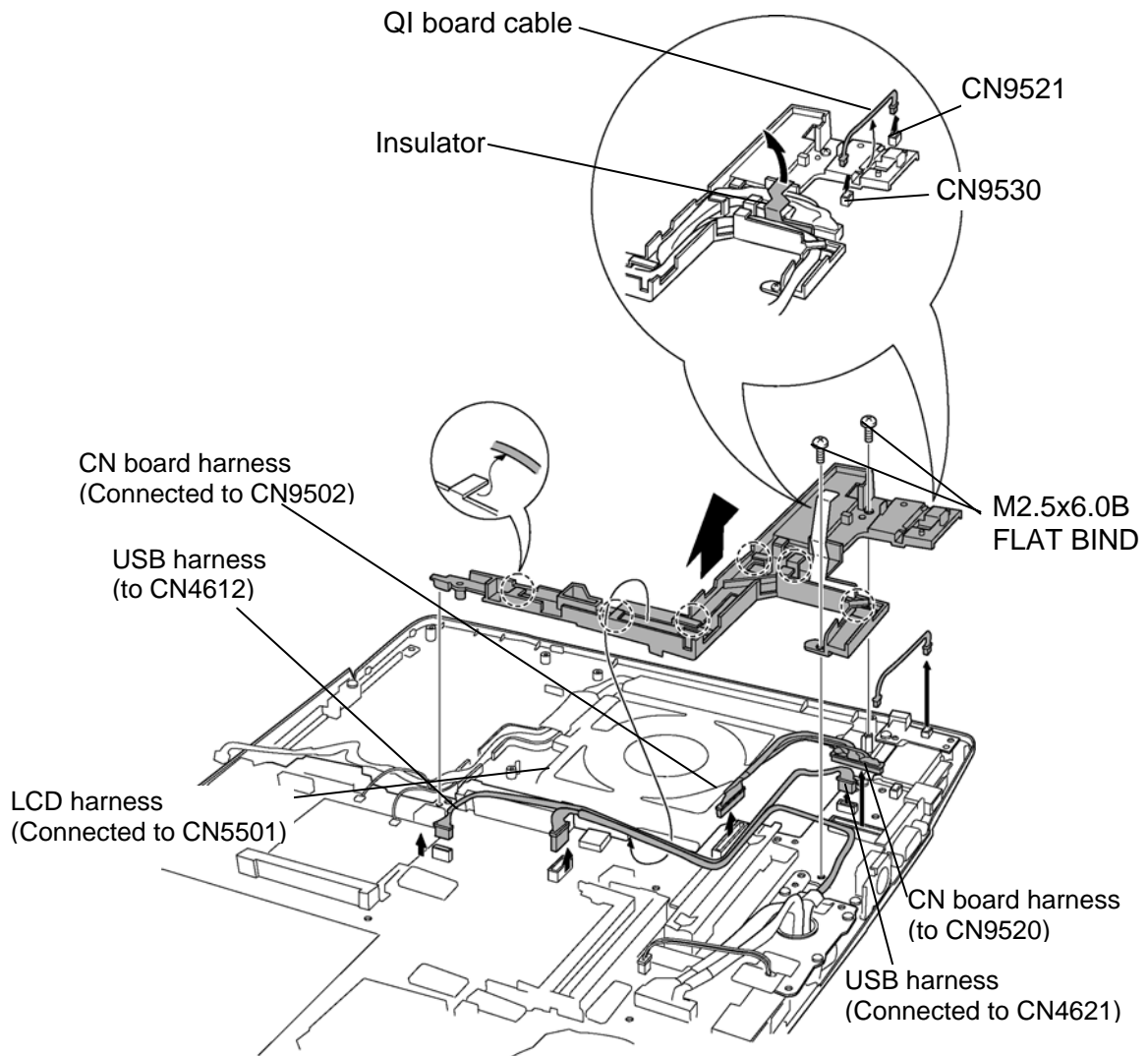


Figure 4-27 Removing the LCD harness holder

## Installing the LCD harness holder

The following describes the procedure for installing the LCD harness holder (See Figure 4-27).

1. Install the **LCD harness holder** to the cover assembly by fitting the boss and secure it with the following **screws**.
  - M2.5x6.0B FLAT BIND screw x2
2. Connecting the **QI board cable** to the connector **CN9521** on the CN board and to the connector **CN9530** on the QI board, arrange the QI board cable along the guide of LCD harness holder.
3. Connecting the **CN board harness** to the connector **CN9502** on the system board and to the connector **CN9520** on the CN board, arrange the CN board harness along the guide of LCD harness holder.

**NOTE:** When connecting the CN board harness, make sure that the connector with core side is connected to the CN board.

4. Connect the **LCD harness** to the connector **CN5501** on the system board and arrange the LCD harness along the guide of LCD harness holder.
5. Connecting the **USB harness** to the connector **CN4612** on the system board and to the connector **CN4621** on the CN board, arrange the USB harness along the guide of LCD harness holder under the insulator.

## 4.18 Mic (L) cable guide

### Removing the Mic (L) cable guide

The following describes the procedure for removing the Mic (L) cable guide. (See Figure 4-28.)

1. Disconnect the **Mic (L) cable** from the connector **CN6060** on the system board and pull it out from the Mic (L) cable guide.
2. Disconnect the **HDD cable** from the connector **CN1900** on the system board.
3. Remove the following screws and **Mic (L) cable guide**.
  - M2.5x6.0B FLAT BIND screw x2

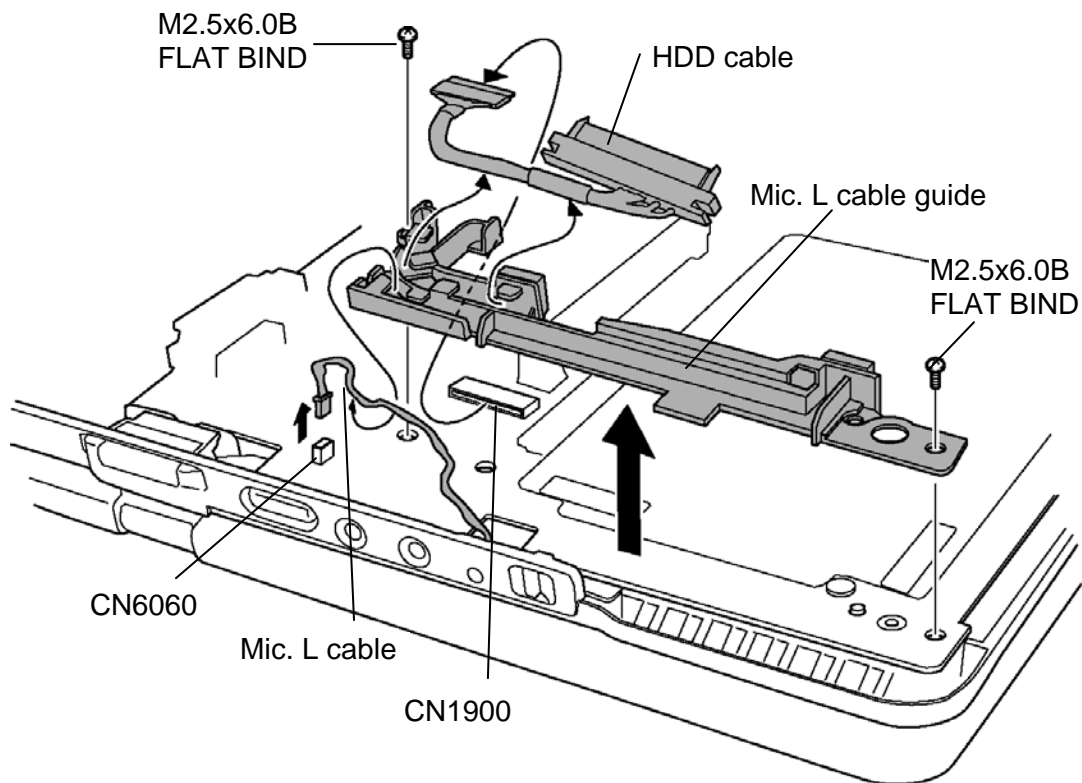
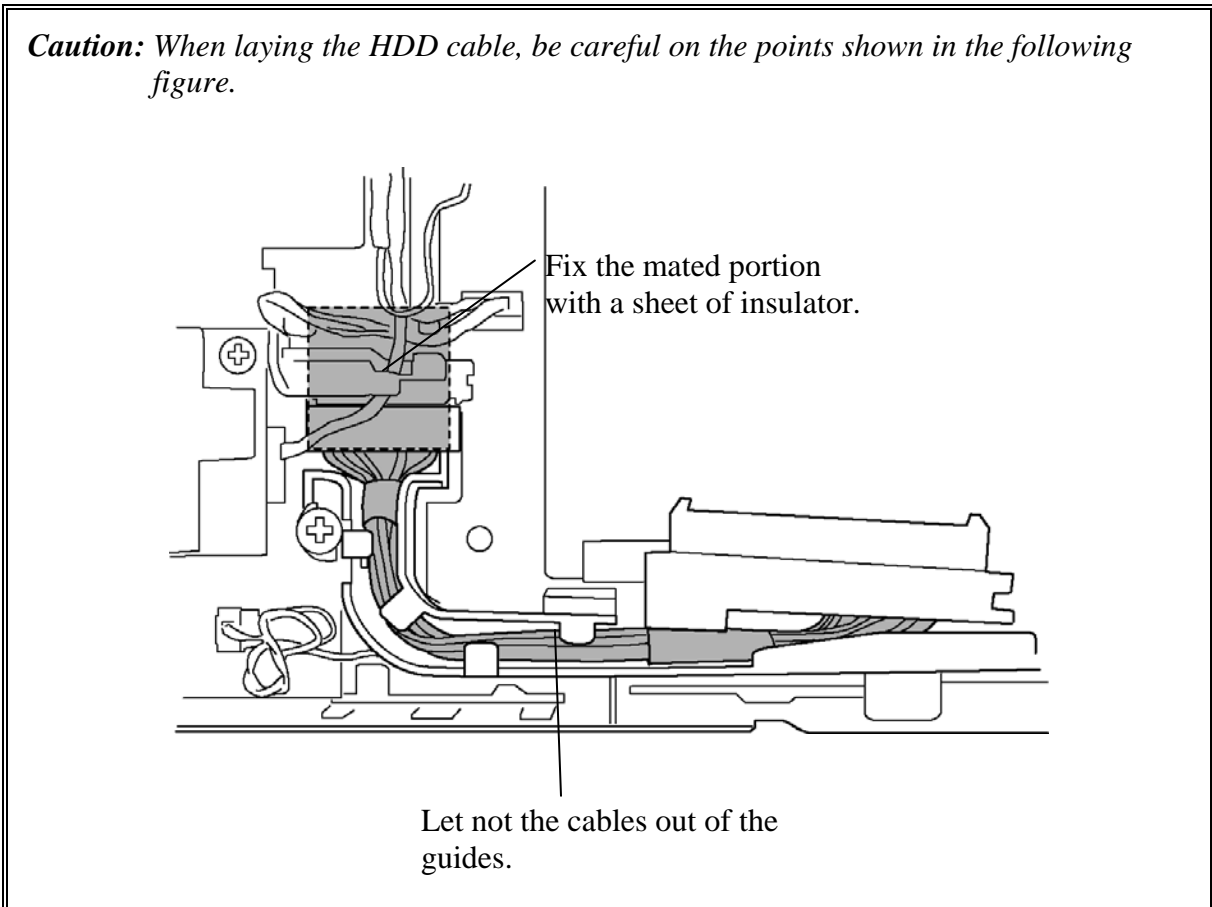


Figure 4-28 Removing the Mic (L) cable guide

### Installing the Mic (L) cable guide

The following describes the procedure for installing Mic (L) cable guide (See Figure 4-28).

1. Connect the **HDD cable** from the connector **CN1900** on the system board.



2. Install the **Mic (L) cable guide** to the system board and secure it with the following screws.
  - M2.5x6.0B FLAT BIND screw x1
3. Connecting the **Mic (L) cable** to the connector **CN6060** on the system board, arrange the cable along the Mic (L) cable guide.

## 4.19 QI board / CN board

### 4.19.1 QI board

#### Removing the QI board

The following describes the procedure for removing the QI board. (See Figure 4-29.)

1. Remove the following **screws** securing the QI board.
  - M2.5x6.0B FLAT BIND screw x1
2. Pull up the QI board straight and remove the **QI board** from the cover assembly.

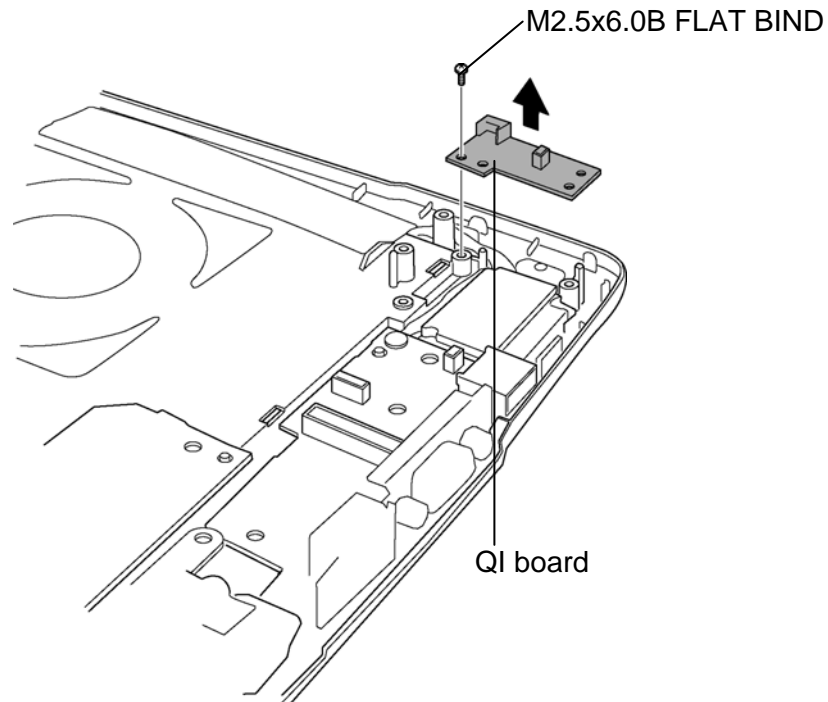


Figure 4-29 Removing the QI board

#### Installing the QI board

The following describes the procedure for installing the QI board. (See Figure 4-29.)

1. Install the **QI board** to the cover assembly and secure it with the following **screws**.
  - M2.5x6.0B FLAT BIND screw x1

## 4.19.2 CN board

### Removing the CN board

The following describes the procedure for removing the CN board. (See Figure 4-30.)

1. Remove the following **screws** securing the CN board.
  - M2.5x6.0B FLAT BIND screw x2
2. Pull up to remove the **CN board** from the cover assembly.

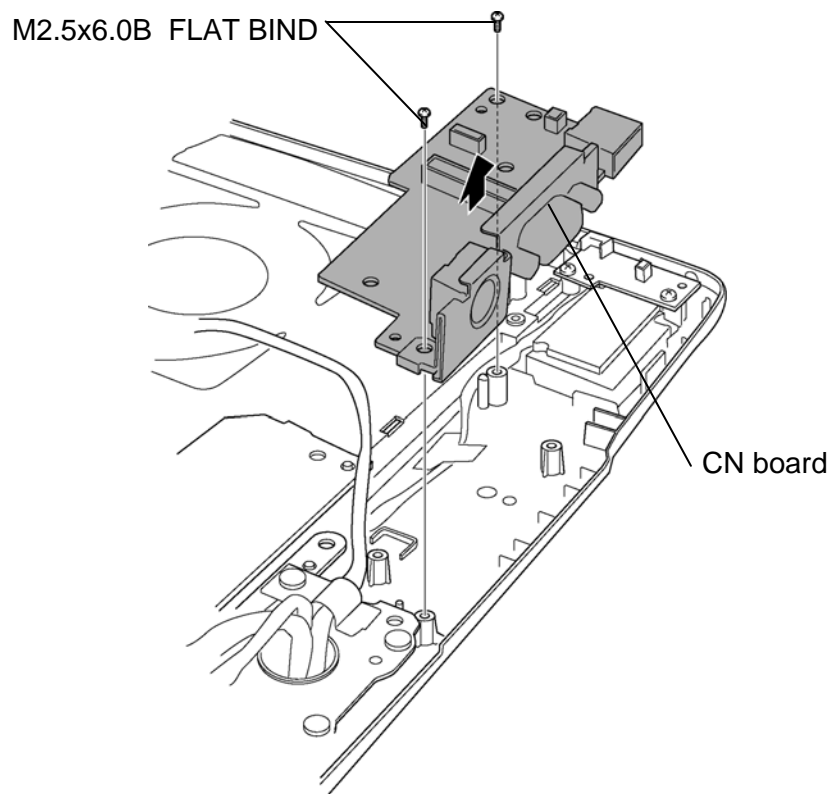


Figure 4-30 Removing the CN board

### Installing the CN board

The following describes the procedure for installing the CN board. (See Figure 4-30.)

1. Install the **CN board** to the cover assembly and secure it with the following **screws**.
  - M2.5x6.0B FLAT BIND screw x2



## 4.20 System board

### Removing the system board

The following describes the procedure for removing the system board. (See Figure 4-31.)

1. Disconnect the **Mic (R) cable** from the connector **CN6061** on the system board
2. Disconnect the **rotation sensor cable** from the connector **CN3280** on the system board
3. Disconnect the **digitizer cable** from the connector **CN9540** on the system board
4. Remove the following **screws** securing the system board.
  - M2.5x6.0B FLAT BIND screw x1
5. Remove the **system board** from the cover assembly while pulling it up toward arrow pointing.

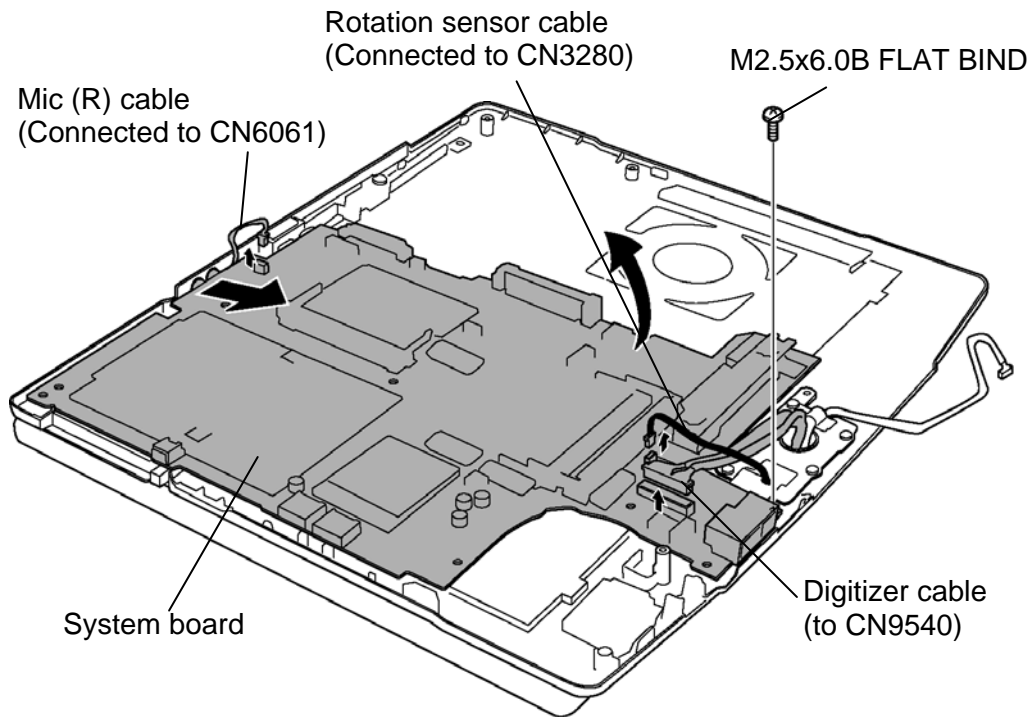


Figure 4-31 Removing the system board



### Installing the system board

The following describes the procedure for installing the system board. (See Figure 4-31.)

1. Install the **system board** to the cover assembly and secure it with the following **screw**.
  - M2.5x6.0B FLAT BIND screw x1

***NOTE:** When installing the system board, be careful not to catch the Mic (L&R) cable, rotation sensor cable and digitizer cable between the system board and cover assembly. Also confirm that these cables are not hidden under the system board.*

2. Connect the **digitizer cable** to the connector **CN9540** on the system board.
3. Connect the **rotation sensor cable** to the connector **CN3280** on the system board.
4. Connect the **Mic (R) cable** to the connector **CN6061** on the system board.

## 4.21 PC card slot cover

### Removing the PC card slot cover

The following describes the procedure for removing the PC card slot cover. (See Figure 4-32.)

1. Lift the **insulator** and remove the following **screws** securing the PC card slot cover.
  - M2.0x3.0S S-THIN FLAT BIND screw x2
2. Release the **hook** (2 points) and remove the **PC card slot cover**.

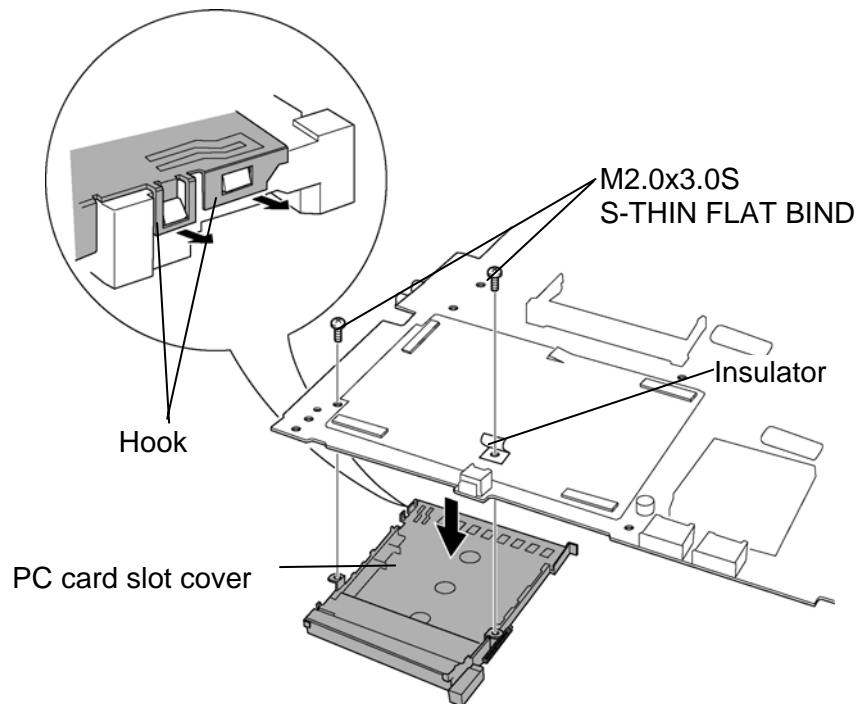


Figure 4-32 Removing the PC card slot cover

### Installing the PC card slot cover

The following describes the procedure for installing the PC card slot cover. (See Figure 4-32.)

1. Secure the **hook** (2 points) and install the **PC card slot cover**.
2. Secure the PC card slot cover with the following **screws**.
  - M2.0x3.0S S-THIN FLAT BIND screw x2

## 4.22 Speaker

### Removing the speaker

The following describes the procedure for removing the speaker. (See Figure 4-33.)

1. Turn up the **guide insulator**.
2. Pull out the **speaker cable** from the **ferrite sheet** of cover assembly.
3. Pull out the **speaker** from the slot of cover assembly.

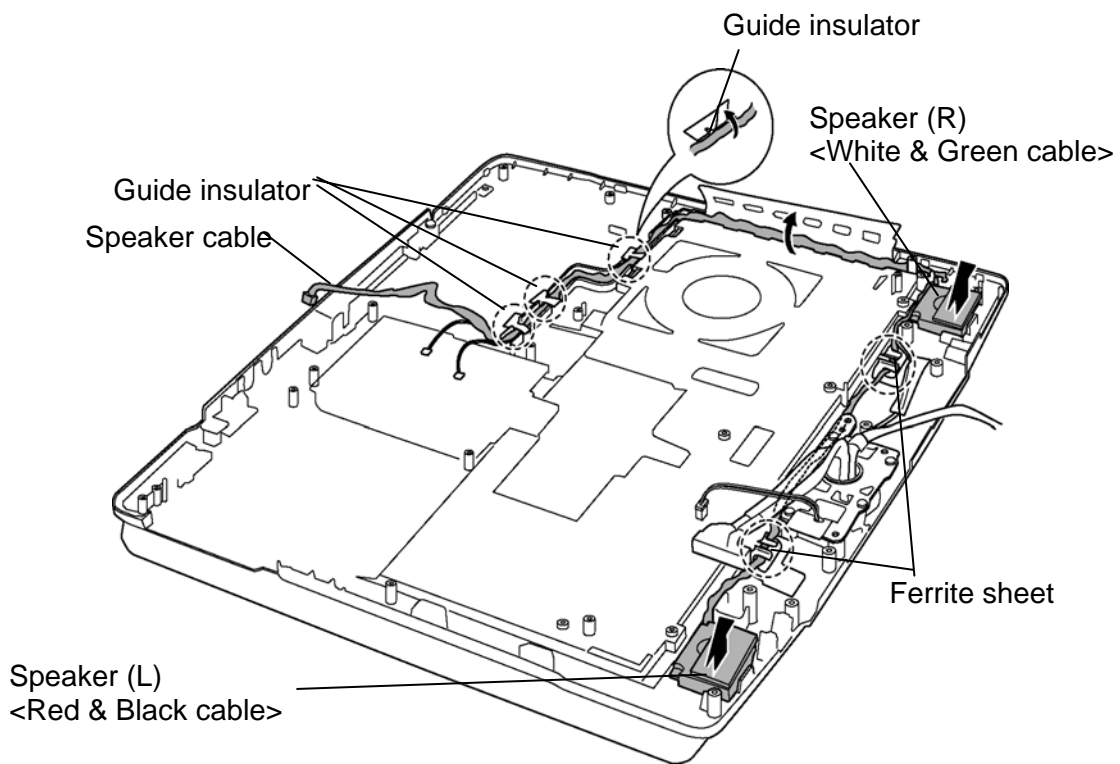


Figure 4-33 Removing the speaker

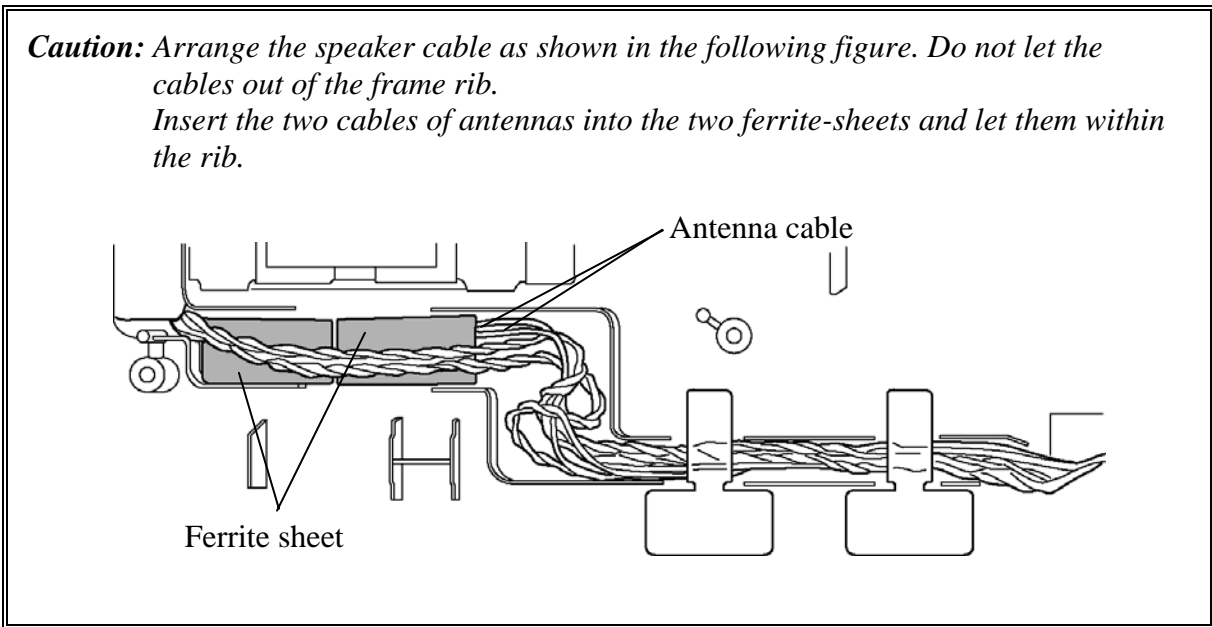
### Installing the speaker

The following describes the procedure for installing the speaker. (See Figure 4-33.)

1. Install the **speaker** to the slot of cover assembly.

**NOTE:** When installing the speaker, confirm the right installation of right and left speaker. (Right = White and Green cable, Left = Red and Black cable).

2. Arrange the **speaker cable** along the **guide insulator**.



3. Stick the **guide insulator** over the guide of speaker cable.

## 4.23 Microphone / Front panel

### 4.23.1 Microphone

#### Removing the microphone

The following describes the procedure for removing the microphone. (See Figure 4-34.)

1. Remove the following **screws** securing the both right and left Mic holder.
  - M2.5x4.0B FLAT BIND screw x2 (x1 for each side)
2. Pull up the **Mic holder** straight and remove the mic holder from the cover assembly.
3. Remove the **microphone** from the slot of cover assembly.

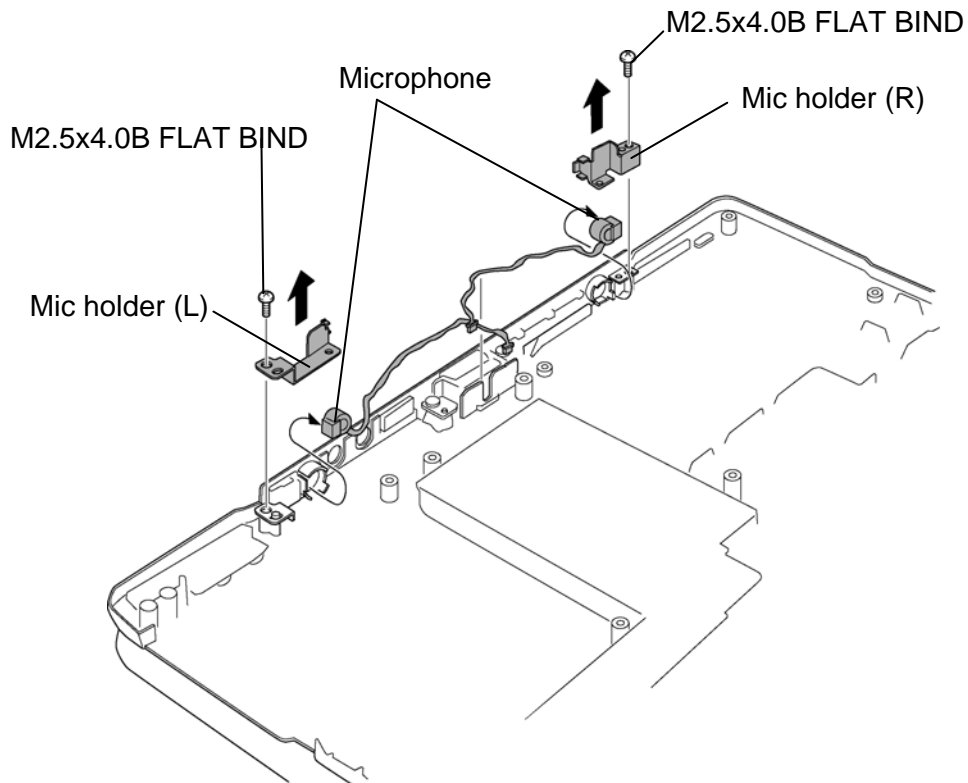


Figure 4-34 Removing the microphone

## Installing the microphone

The following describes the procedure for installing the microphone. (See Figure 4-34.)

1. Fitting the microphone to the shapes of slot, install the **microphone** to the cover assembly.
2. Install the **Mic holder** to the cover assembly while fitting it to the slit of cover assembly and secure them with the following **screws**.

- M2.5x4.0B FLAT BIND screw x2 (x1 for each side)

### 4.23.2 Front panel

#### Removing the front panel

The following describes the procedure for removing the front panel. (See Figure 4-35.)

1. Remove the following **screws** and **front panel** from the cover assembly.

- M2.5x6.0B FLAT BIND screw x2

2. Detach the **display latch** from the front panel.

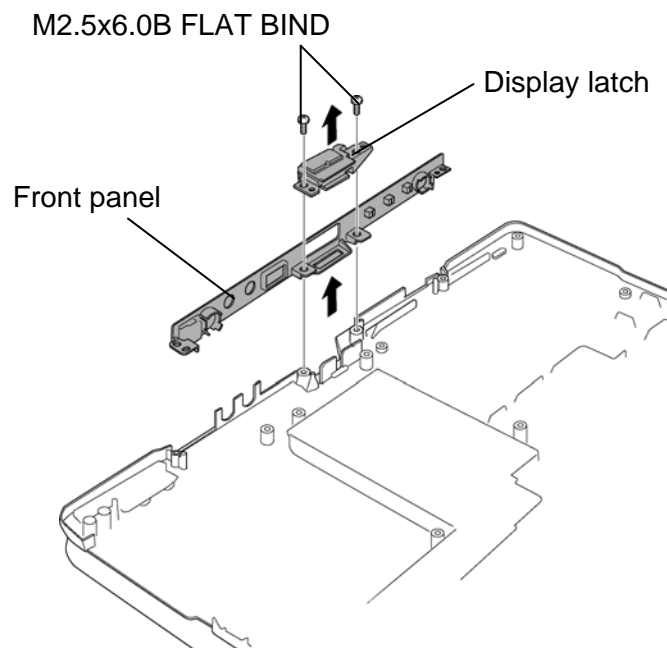


Figure 4-35 Removing the front panel

**Installing the front panel**

The following describes the procedure for installing the front panel. (See Figure 4-35.)

1. Install the display latch to the **front panel**.
2. Install the **front panel** to the cover assembly and secure it with the following **screws**.
  - M2.5x6.0B FLAT BIND screw x2

## 4.24 Lens holder

### Removing the lens holder

The following describes the procedure for removing the lens holder. (See Figure 4-36.)

1. Remove the following **screw** securing the lens holder.
  - M2.5x4.0B S-THIN FLAT BIND screw x1
2. Remove the **lens holder** from the cover assembly.

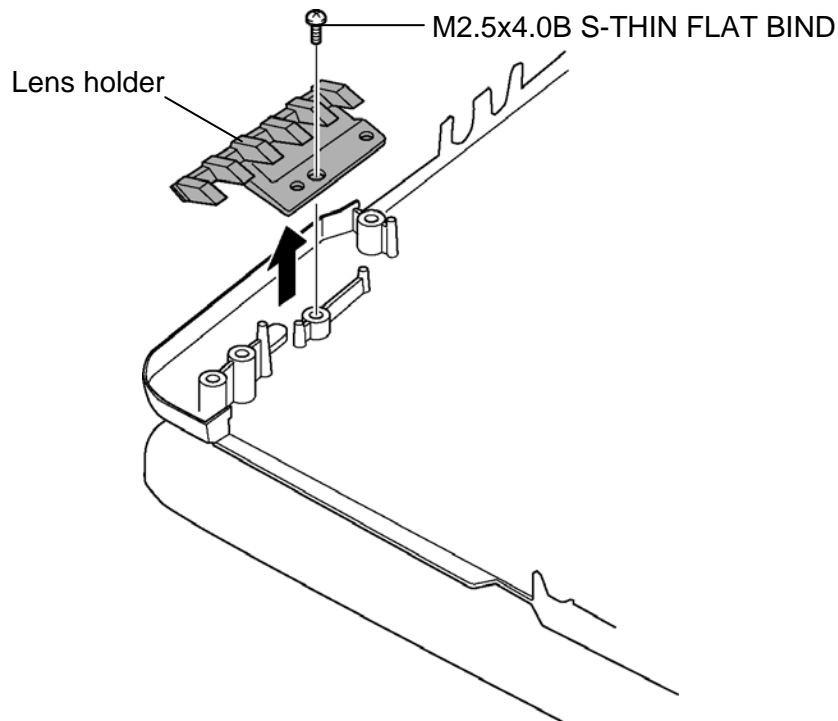


Figure 4-36 Removing the lens holder

### Installing the lens holder

The following describes the procedure for installing the lens holder. (See Figure 4-36.)

1. Install the **lens holder** to the cover assembly.
2. Secure the lens holder with the following **screw**.
  - M2.5x4.0B S-THIN FLAT BIND screw x1



## 4.25 Touch pad

### Removing the touch pad

The following describes the procedure for removing the touch pad. (See Figure 4-37.)

1. Peel the insulator.
2. Remove the following **screws** securing the touch pad.
  - M2.0x4.0S S-THIN FLAT BIND screw x2
3. Remove the **touch pad holder** and **touch pad** from the cover assembly.
4. Peel off the **glass tape** and disconnect the **touch pad cable** from the touch pad.

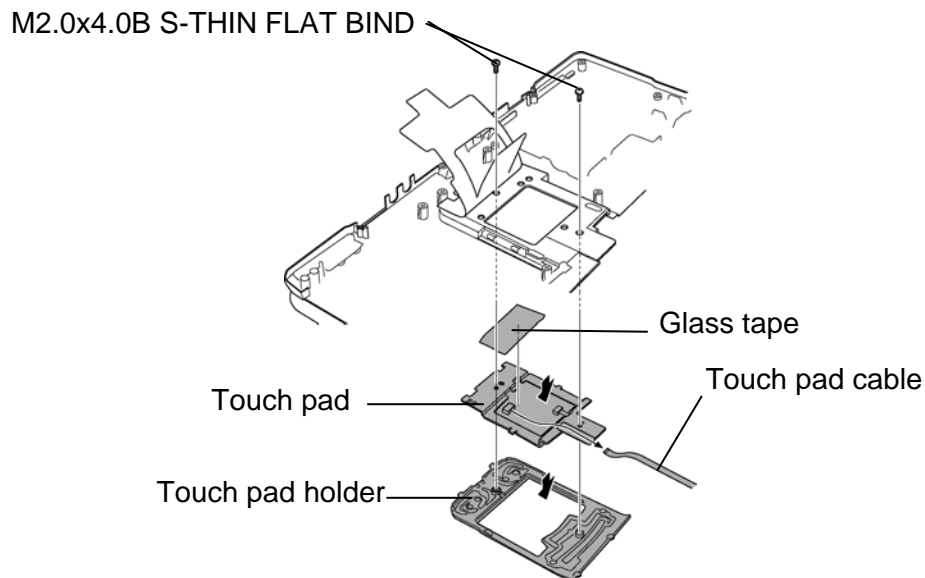


Figure 4-37 Removing the touch pad

### Installing the touch pad

The following describes the procedure for installing the touch pad (See Figure 4-37.).

1. Connect the **touch pad cable** to the touch pad and stick the **glass tape**.
2. Install the **touch pad** and **touch pad holder** to the cover assembly.
3. Secure the **touch pad** with the following **screws** and stick the **insulator**.
  - M2.0x4.0B S-THIN FLAT BIND screw x2

## 4.26 LCD unit & FL inverter

### Removing the LCD unit & FL inverter

The following describes the procedure for removing the LCD unit & FL inverter. (See Figure 4-38 to 4-41.)

**NOTE:** When replacing the LCD unit, do not give the hinge portion a strong press. It may cause the breakage of the hinge assembly.  
Also, Use a stand or something under the LCD part to keep the LCD part level while replacing it.

1. Peel off the **mask seals** (6 points) from the LCD mask.
2. Remove the following **screws** securing the LCD mask.
  - M2.5x6.0S FLAT BIND screw x6
3. Laying down the LCD unit and the cover assembly flat, release the latches to remove the **LCD mask**.
4. Remove the **cross function button** from the application switch board.

**NOTE:** When removing the LCD mask, be careful not to lose the cross function button because the button is easily removed.

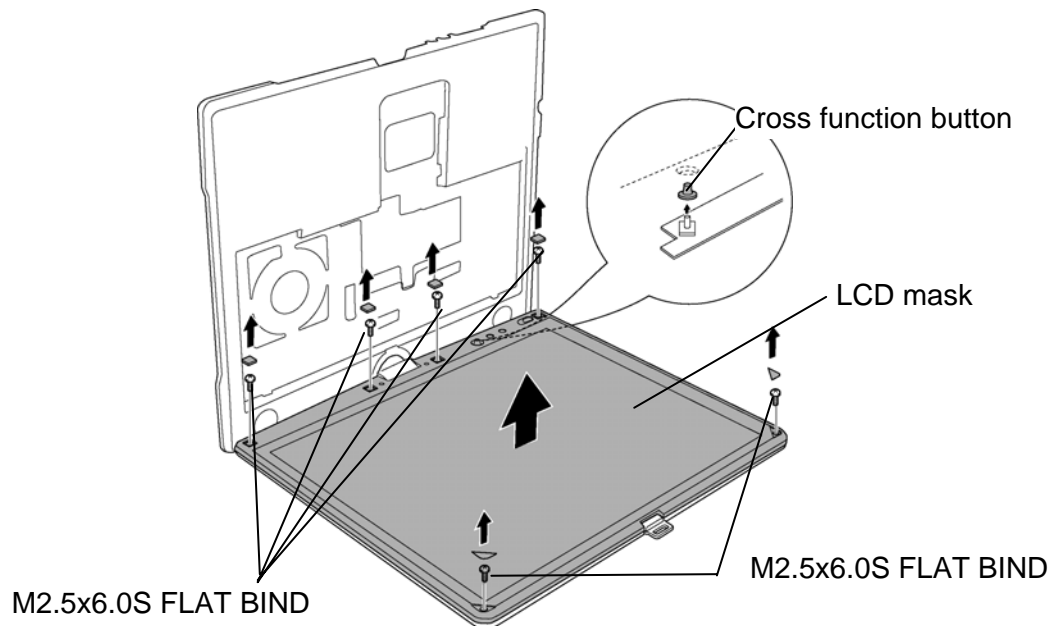


Figure 4-38 Removing the LCD mask

5. Turn up the **insulator** and disconnect the **HV cable** from the connector of FL inverter.
6. Remove the following **screws** securing the LCD unit.
  - M2.5x4.0B FLAT BIND screw x4
7. With the bottom edge of the LCD unit on the display cover, raise the top edge of the LCD unit.

**NOTE:** When putting the LCD unit on the display cover, lay a mat or something under the LCD unit to protect the computer and the LCD from a scratch or breakage.

8. Peeling off the **copper tape** and **glass tape** and disconnect the **LCD harness** and **digitizer harness** from the connectors on the back of LCD unit.
9. Remove the **LCD unit** from the display cover.

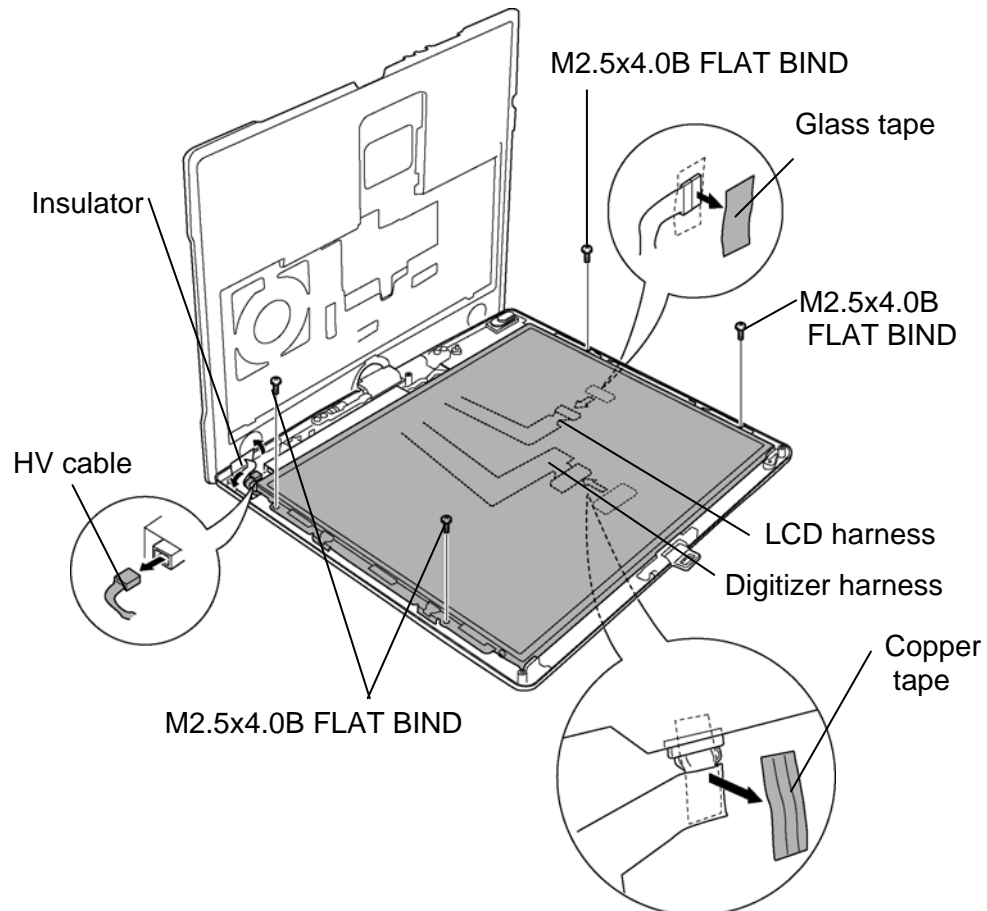


Figure 4-39 Removing the LCD unit

10. Remove the following **screws** securing the **LCD unit holder**.

- M2.5x4.0S FLAT BIND screw x8

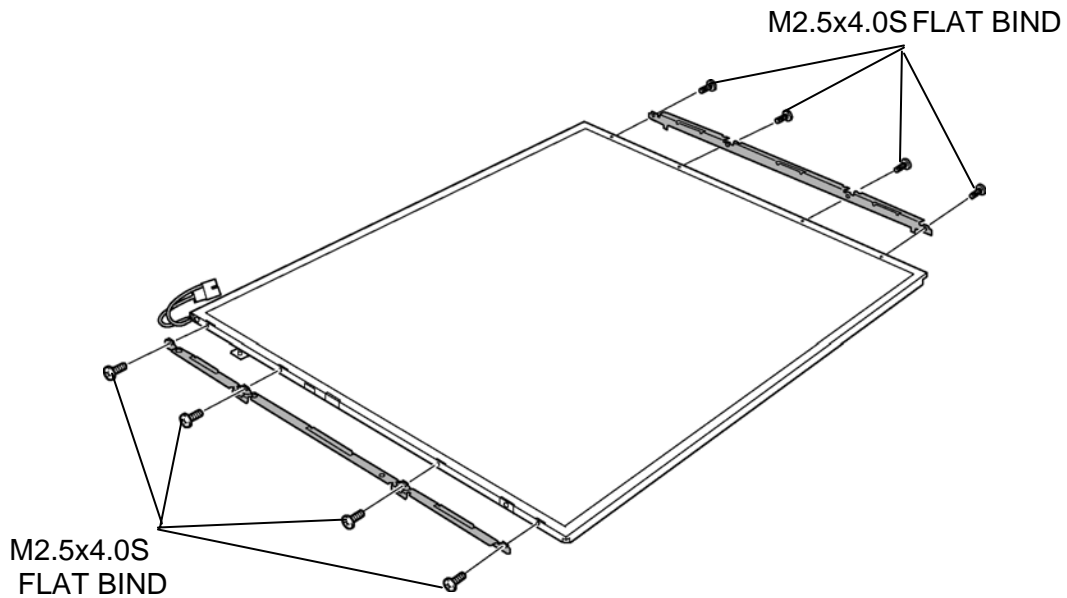


Figure 4-40 Removing the LCD unit holder

11. Pull up the FL inverter while peeling off the double-sided tape.

**CAUTION:** The removed FL inverter is not reusable. Therefore when installing the FL inverter, it must be a new one.

12. Disconnect the **inverter harness** and remove the **FL inverter** from the display cover.

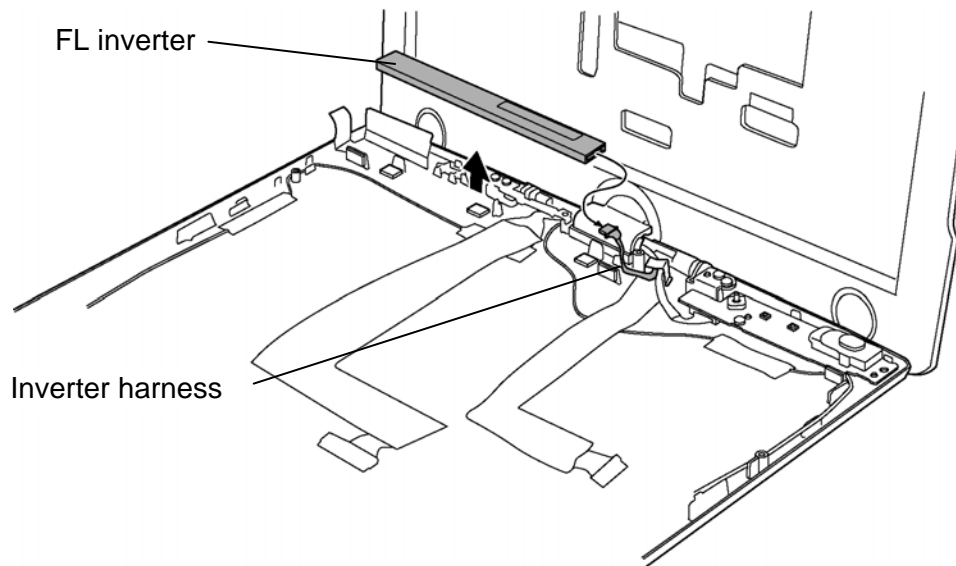


Figure 4-41 Removing the FL inverter

## Installing the LCD unit & FL inverter

The following describes the procedure for installing the LCD unit & FL inverter. (See Figure 4-38 to 4-41.)

1. Connecting the **inverter harness** to the connector of FL inverter, install the **FL inverter** to the display cover.

**CAUTION:** *The FL inverter once removed from the computer is not reusable. When installing the FL inverter, be sure to use a new one.*

2. Install the following **screws** securing the LCD unit holder.
  - M2.5x4.0S FLAT BIND screw x8
3. Standing the LCD unit on the display cover, connect digitizer harness and LCD harness on the back of LCD unit.
4. Stick the **copper tape** and **glass tapes** on the each connector.
5. Install the **LCD unit** on the display cover and secure it with the following **screws**.
  - M2.5x4.0B FLAT BIND screw x4
6. Connect the **HV cable** to the connector of FL inverter and stick the **insulator**.
7. Set the **cross function button** to the application switch board by fitting the cross slit of the button.
8. Install the **LCD mask** to the display cover while securing the latches.

**NOTE:** *When installing the LCD mask, wipe the LCD with a soft cloth and make the back of the LCD mask clean with an ionizer.  
And also, confirm that the cross function button is installed.*

9. Secure the LCD mask with the following **screws** and stick the **mask seals** (6 points).
  - M2.5x6.0S FLAT BIND screw x6

## 4.27 Application switch board

### Removing the application switch board

The following describes the procedure for removing the application switch board. (See Figure 4-42.)

1. Remove the following **screws** securing the application switch board and pull up the **application switch board**.
  - M2.5x4.0B FLAT BIND screw x1
2. Disconnect the **switch harness** from the connector **CN9510** on the application switch board.

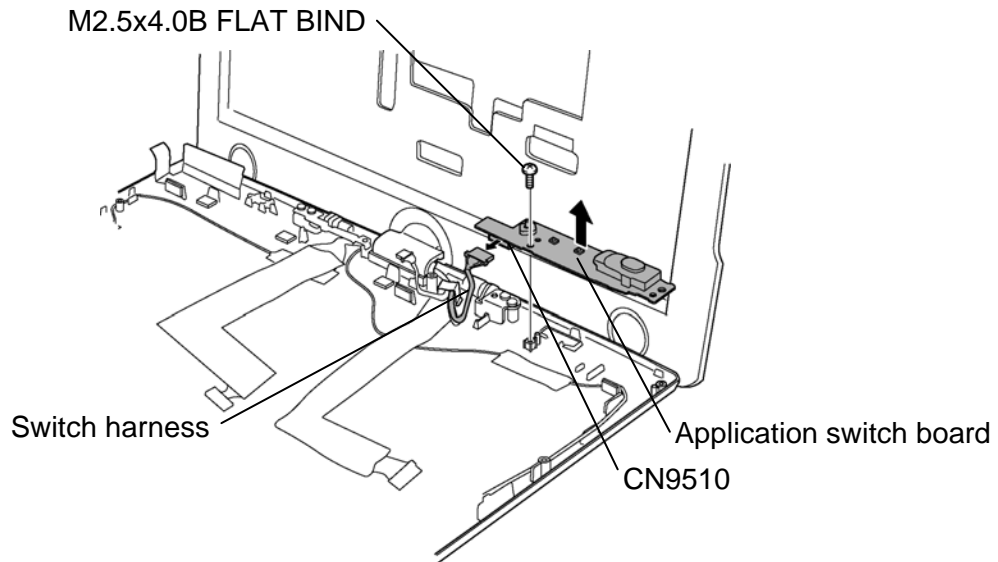


Figure 4-42 Removing the application switch board

### Installing the application switch board

The following describes the procedure for installing the application switch board. (See Figure 4-42.)

1. Connect the **switch harness** to the connector **CN9510** on the application switch board.
2. Install the **application switch board** to the display cover and secure it with the following **screws**.
  - M2.5x4.0B FLAT BIND screw x1

## 4.28 LCD latch assembly

### Removing the LCD latch assembly

The following describes the procedure for removing the LCD latch assembly. (See Figure 4-43.)

1. Remove the following **screw** and **LCD latch assembly** from the display cover.

- M2.5x4.0B FLAT BIND screw x1

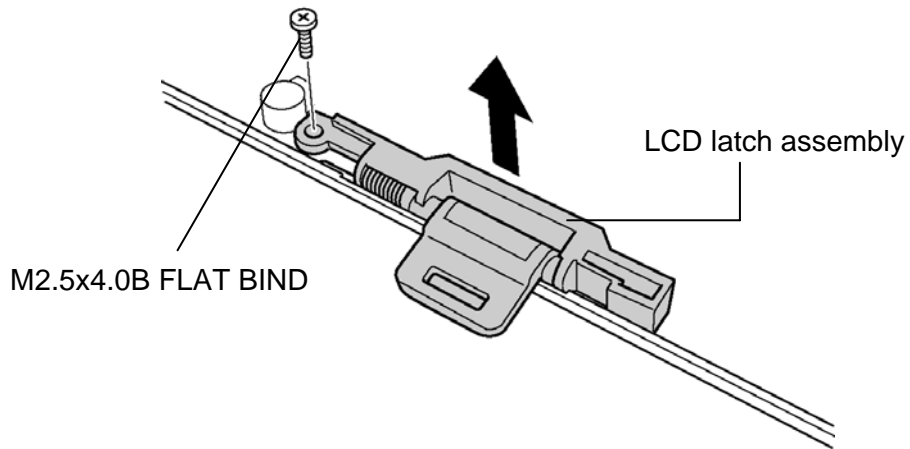


Figure 4-43 Removing the LCD latch assembly

### Installing the LCD latch assembly

The following describes the procedure for installing the LCD latch assembly. (See Figure 4-43.)

1. Install the **LCD latch assembly** and secure it with the following **screw**.

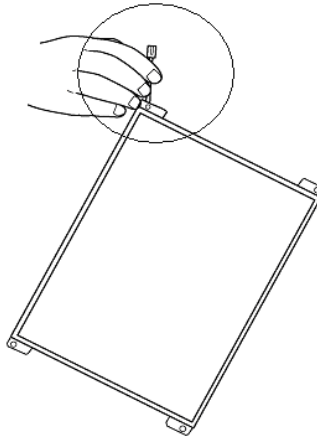
- M2.5x4.0B FLAT BIND screw x1

## 4.29 Digitizer

**Caution:** Read following instructions before handling the Digitizer.

Do not carry the LCD module by holding the FL cable in one's hand because it may result to cut the FL cable, and cause display function failure or lighting failure.

**NO**

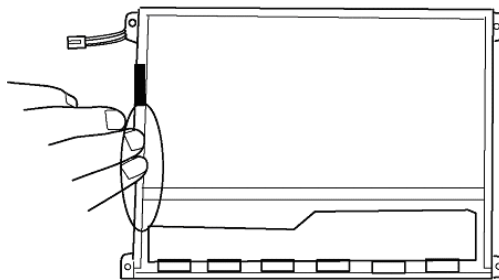


Do not carry the LCD module by holding the FL cable in one's hand.

Be careful to use the bezel guide.

There is a portion where the bezel is sticking out because of the digitizer guide. Do not press and rub the portion with bare hands or it may result cut your finger.

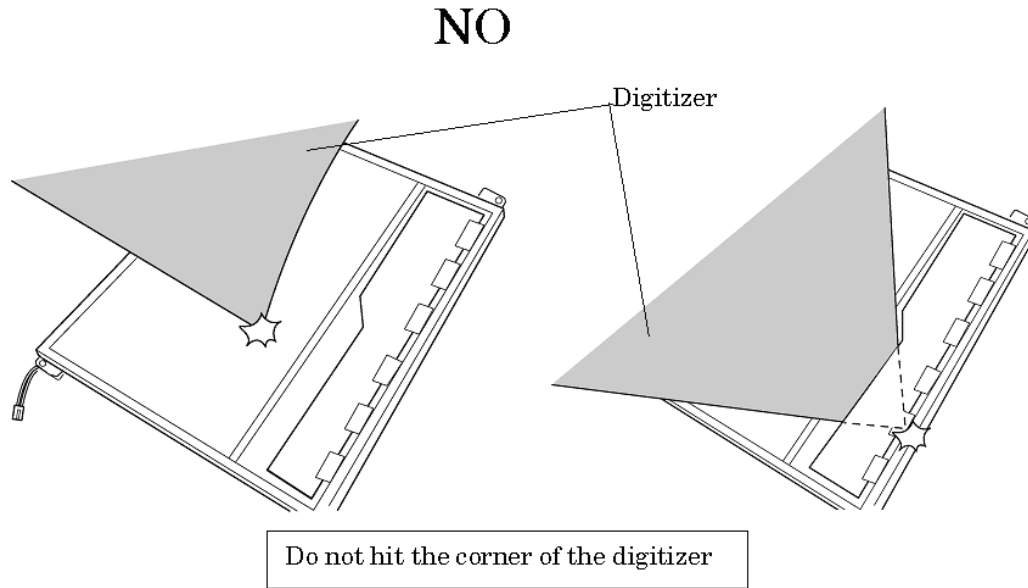
**NO**



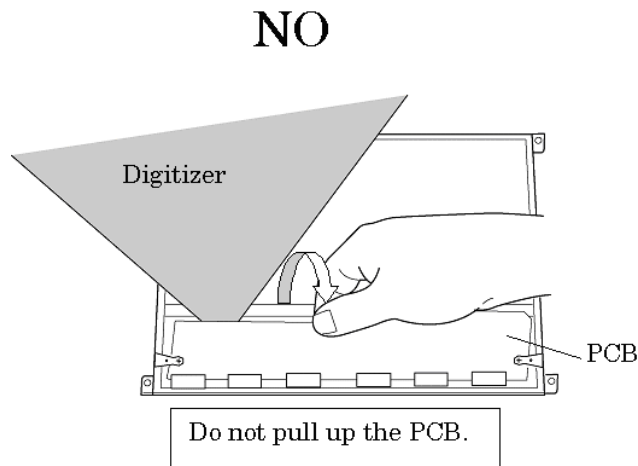
Be careful to use the bezel guide.



*Do not make any scratches on the B/L and TAB by the edge of the digitizer when installing the digitizer because it may result to break the TAB or make scratches on the B/L and cause display function failure.*



*Do not pull up the PCB hardly when installing the digitizer because it may result to give stress on the TAB or PCB and cause the display function failure.*

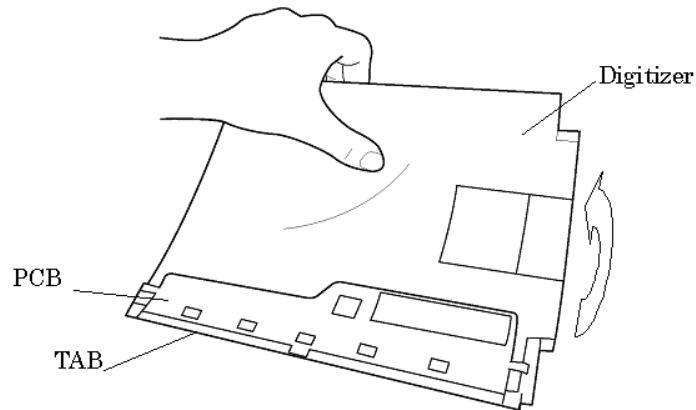


*Make sure that three latches fit the digitizer securely.*

*If the latches are not locked securely, it may result to move the digitizer and give stress on the TAB or PCB and cause the display function failure.*

*Do not turn up the digitizer because it may result to give stress on the TAB or PCB and cause the display function failure.*

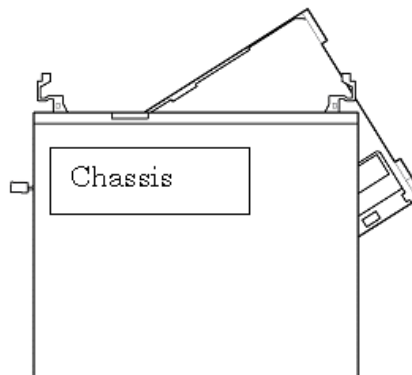
**NO**



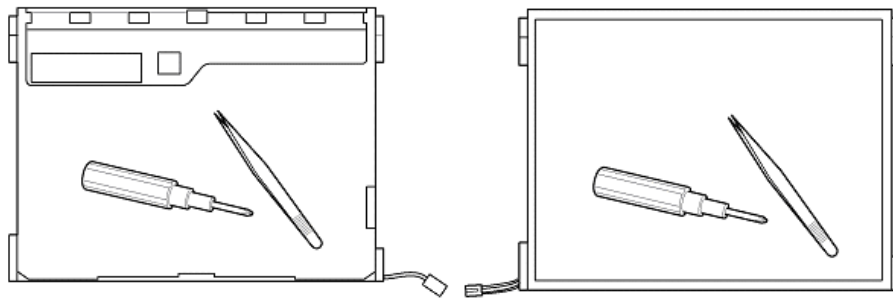
Do not turn up the digitizer to avoid the warp of the PCB.

*Do not put any instrument on the LCD module because it may result to make scratch on the cell, polarization sheet or B/L and break the TAB and may cause the display function failure.*

**NO**



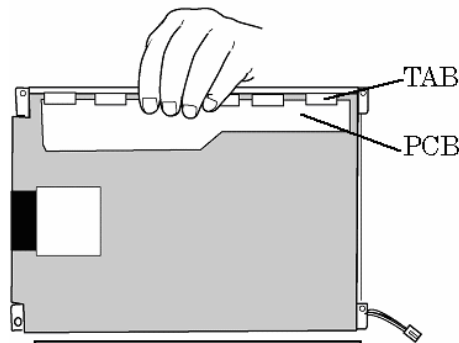
Do not put the chassis on the LCD.



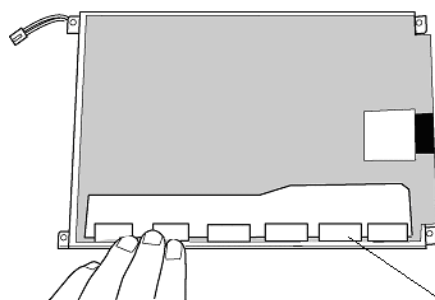
Do not put the instrument on the LCD.

*Do not hold, press and rub the TAB because it may result to break the TAB and cause the display function failure.*

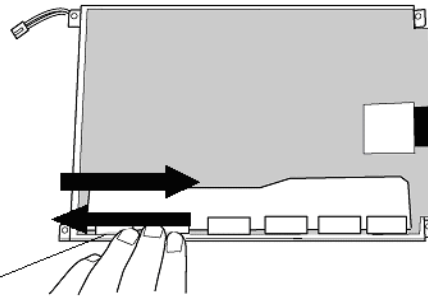
**NO**



Do not hold the TAB.

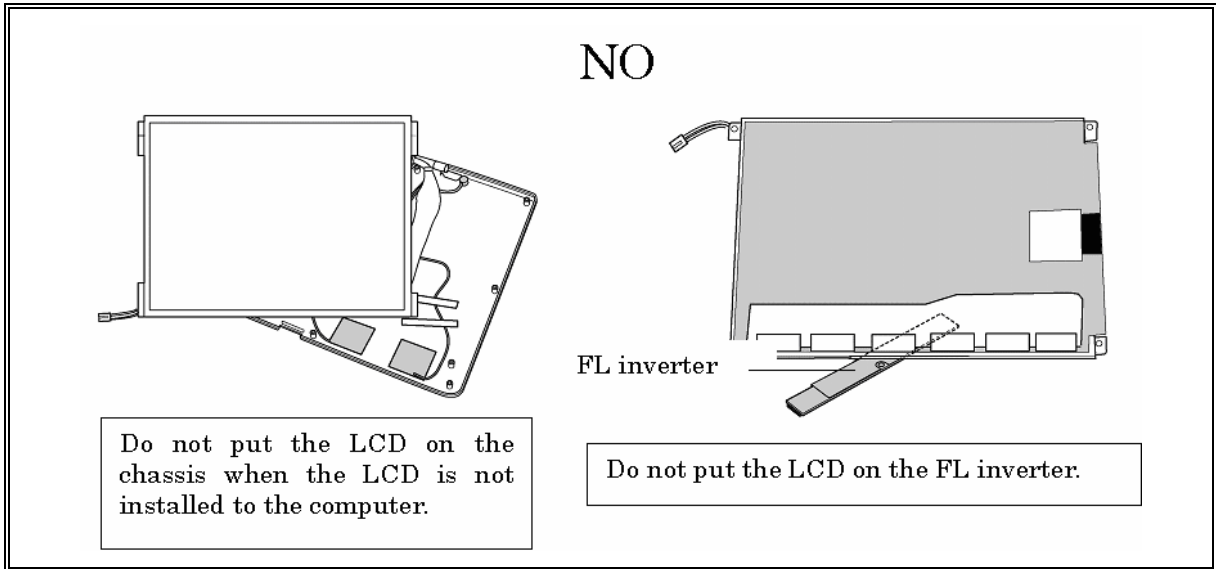


Do not press the TAB.



Do not rub the TAB.

*Make sure to put the LCD module on the flat place. If the LCD module is put on the uneven place, it may result to break the TAB, make scratch on the B/L or polarization sheet and cause the display function failure.*



## Removing the Digitizer

The following describes the procedure for removing the digitizer. (See Figure 4-44.)

1. Remove the following **screws** securing the digitizer.
  - M2.0x3.0Z BIND screw x3
2. Slide out the **digitizer** toward the arrow pointing.

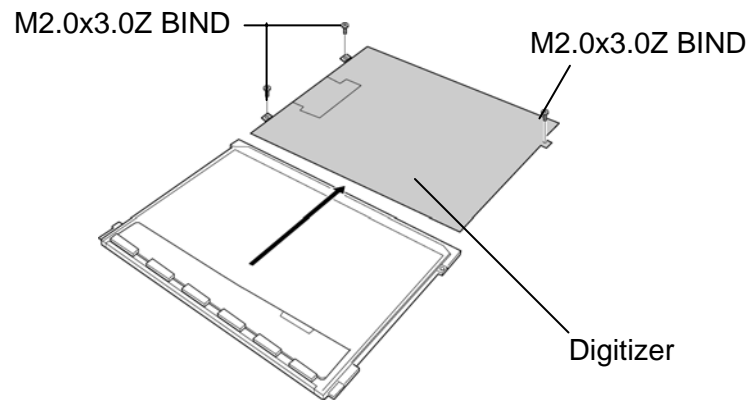


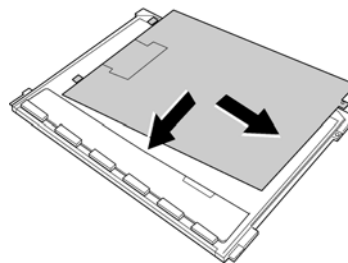
Figure 4-44 Removing the digitizer

## Installing the digitizer

The following describes the procedure for installing the digitizer. (See Figure 4-44.)

1. Slide the **digitizer** into the back pocket of LCD.

**Caution:** When replacing the digitizer, fit the digitizer into the back of LCD toward the arrow pointing.



2. Secure the digitizer with the following **screws**.
  - M2.0x3.0Z BIND screw x3

## 4.30 LCD harnesses & Wireless LAN/Bluetooth antennas

### Removing the LCD harnesses & Wireless LAN/Bluetooth antennas

The following describes the procedure for removing the LCD harness & wireless LAN/Bluetooth antennas. (See Figure 4-45 and 4-46.)

1. Pull out the **wireless LAN antenna cables / Bluetooth antenna cable** from the guide.
2. Remove the following **screws** and **LCD harness holder**.
  - M2.5x2.8B FLAT BIND screw x1
3. Remove the following **screws** and **digitizer harness holder**.
  - Unique screw CPU stud screw x1
  - M2.5x6.0S PSP TIGHT screw x1
4. Remove the following **screws** securing the **hinge assembly**.
  - M2.5x6.0B FLAT BIND screw x1
  - M2.5x6.0S PSP TIGHT screw x1
5. Remove the **hinge rear cover** from the hinge assembly.

6. Detach the **cover assembly** from the display cover.

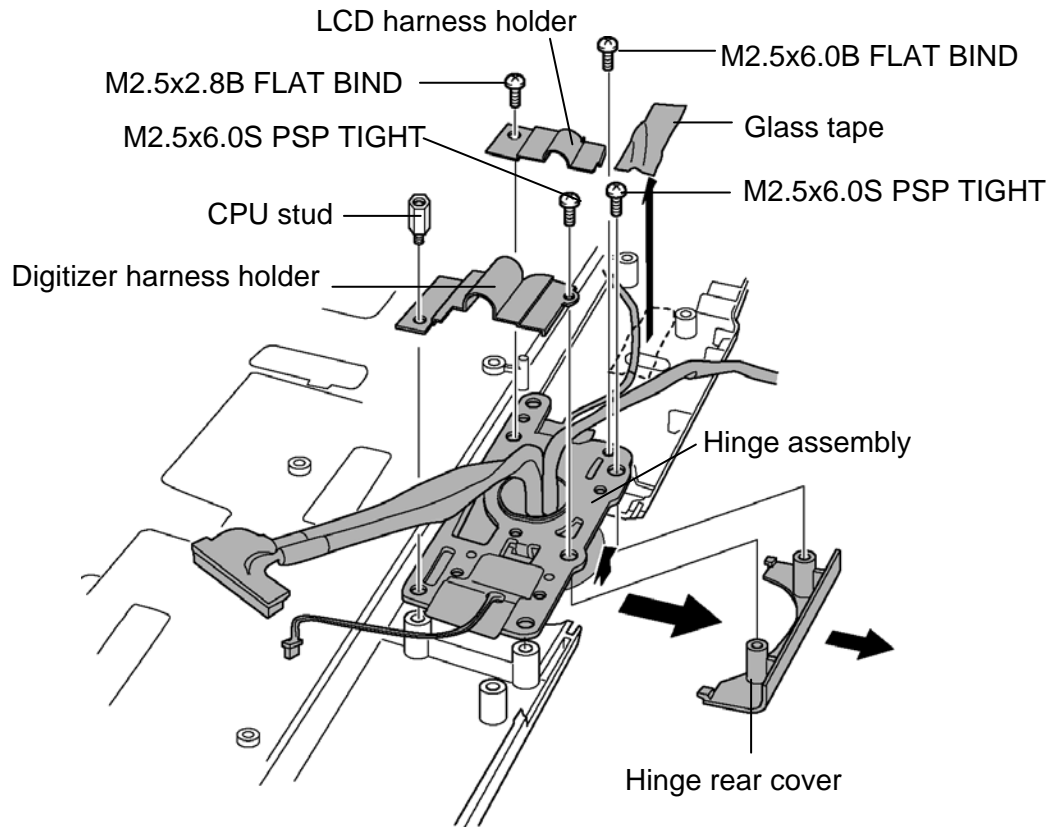


Figure 4-45 Removing the cover assembly

7. Remove the **LCD harness ground plate** from the display cover.

8. Remove the following **screws** and **LCD harness hold plate** from the display cover.

- M2.5x6.0B FLAT BIND screw x2

9. Remove the following **screws** securing the hinge assembly.

- M2.5x6.0B FLAT BIND screw x2

10. Detaching the **hinge assembly** from the display cover, remove the **hinge cap** from the hinge assembly.

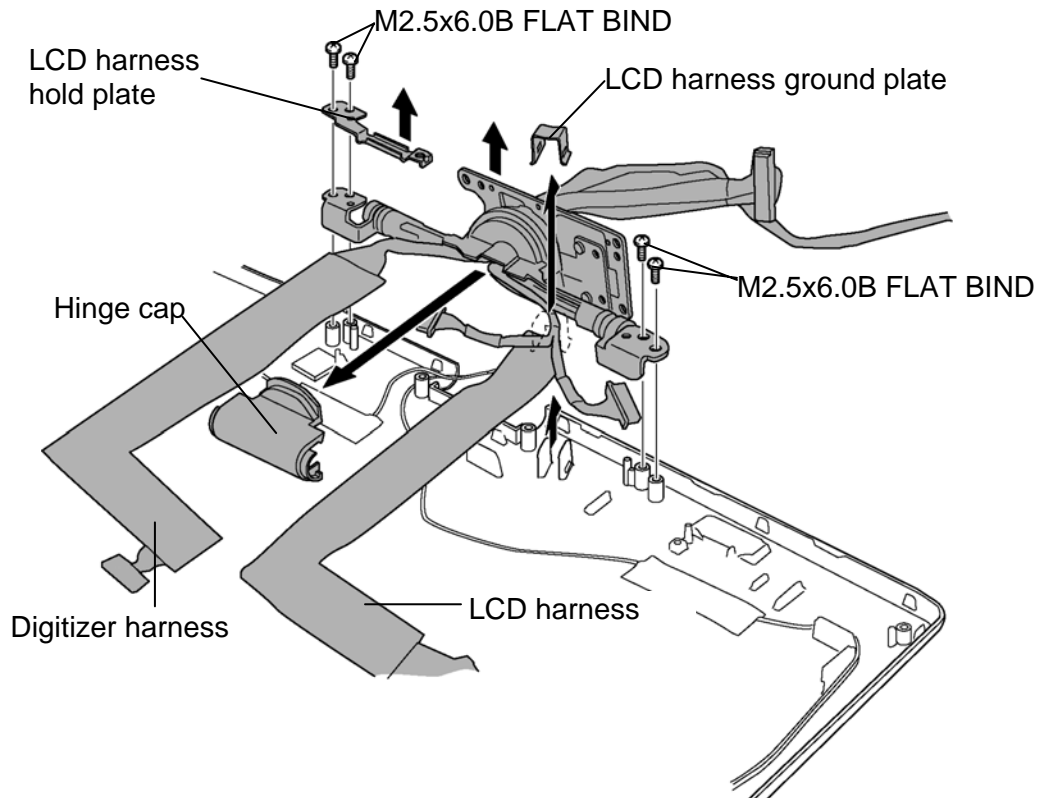


Figure 4-46 Removing the hinge assembly

11. Pull out the **LCD harness** through the hole of hinge assembly.
12. Pull out the **digitizer harness** through the hole of hinge assembly
13. Pull out the **wireless LAN antenna cables/Bluetooth antenna cable** through the hole of hinge assembly
14. Peel off seven **acetate tapes** on the cables.
15. Peel off the **acetate tapes** and **wireless LAN antennas/Bluetooth antenna** and remove them from the display cover.



### Installing the LCD harnesses & Wireless LAN/Bluetooth antennas

The following describes the procedure for installing the LCD harness & wireless LAN/Bluetooth antennas (See Figure 4-45 to 4-47.)

1. Stick the **wireless LAN antennas / Bluetooth antenna** on the display cover and arrange their cables.
2. Stick the **acetate tape** (10 points) on the display cover.

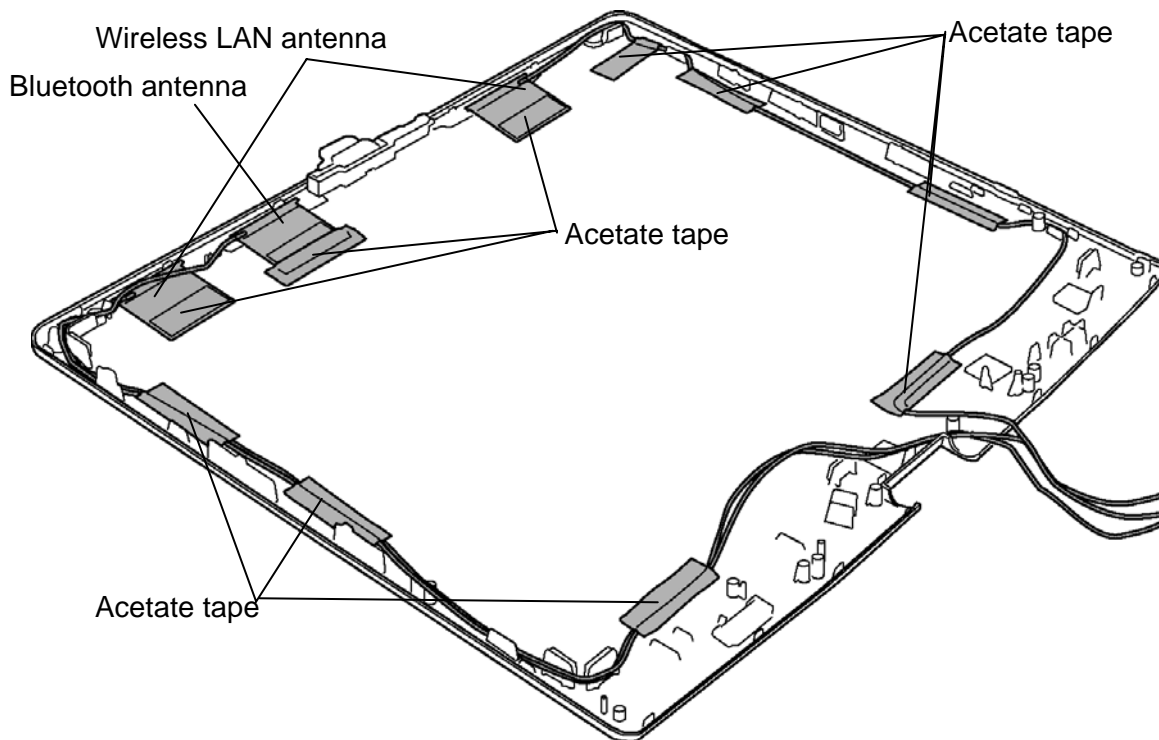


Figure 4-47 Arranging the wireless LAN antenna cables

3. Pass the **LCD harness** through the hole of hinge assembly.
4. Pass the **digitizer harness** through the hole of hinge assembly.
5. Pass the **wireless LAN antenna cables/Bluetooth antenna cable** through the hole of hinge assembly.

6. Installing the **hinge cap** to the hinge assembly, secure the **hinge assembly** to the display cover with the following **screws**.

- M2.5x6.0B FLAT BIND screw x2

***Caution:** Before installing the hinge cap, confirm the right arrangement of each harnesses and cables.*

7. Arranging the **LCD harness** on the display cover, secure the **LCD harness hold plate** with the following **screws**.

- M2.5x6.0B FLAT BIND screw x2

8. Arranging the **digitizer harness** on the display cover, install the **digitizer harness ground plate**.

9. Install the **cover assembly** and **hinge rear cover** to the display cover.

10. Secure the cover assembly to the hinge assembly with the following **screws**.

- M2.5x6.0B FLAT BIND screw x1
- M2.5x6.0S PSP TIGHT screw x1

11. Install the **digitizer harness holder** to the hinge assembly and secure it with the following **screws**.

- Unique screw CPU stad x1
- M2.5x6.0S PSP TIGHT screw x1

12. Install the **LCD harness holder** to the hinge assembly and secure it with the following **screws**

- M2.5x2.8B FLAT BIND screw x1

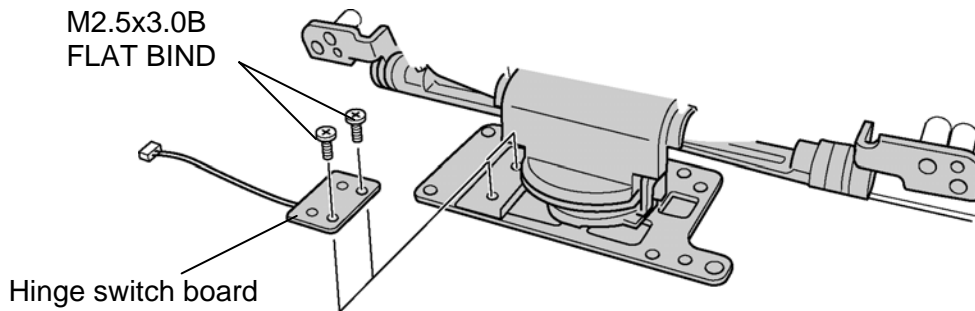
13. Arrange the **wireless LAN antenna cables** / **Bluetooth antenna cable** along the guide of cover assembly.

## 4.31 Hinge Switch Board

### Removing the hinge switch board

The following describes the procedure for removing the hinge switch board. (See Figure 4-48.)

1. Remove the following **screws** and **hinge switch board**.
  - M2.5x3.0B FLAT BIND screw x2
2. Remove the plate placed under the hinge switch board.



*Figure 4-48 Removing the hinge switch board*

### Installing the hinge switch board

The following describes the procedure for installing hinge switch board. (See Figure 4-48.)

1. Install the plate fitting to the bosses on the hinge assembly.
2. Install the hinge switch board and secure it with the following **screws**.
  - M2.5x3.0B FLAT BIND screw x2

## 4.32 Fluorescent lamp

This system uses LCD modules from the following suppliers. The procedure for replacing the fluorescent lamp is different for each LCD module. Refer to the appropriate procedure.

Type	Part No.	Supplier	Section
14.1-inch (SXGA+)	G33C0002P110	TMD	4.32.1

- NOTE:**
- When working with a LCD module, always use a flat, grounded table.
  - Handle the backlight unit in the environment without dust, such as on the clean bench. Keep the worktable free from any screws or other material that may scratch the LCD surface.
  - Use an anti-static or protective sheet.
  - When replacing the FL unit, cover with a finger protector or similar to prevent soiling or scratching the LCD panel.
  - Be careful when handling the lamp. Excessive force may break the lamp.
  - Be careful not to soil or deform the lamp reflector.
  - Make sure that the power of the LCD module is turned off before connecting or disconnecting cables and connectors.

### 4.32.1 Replacing the 14.1 Inch SXGA+ TMD Fluorescent lamp

The following describes the procedure for replacing the fluorescent lamp (See Figure 4-49 to 4-59).

#### Disassembling Fluorescent lamp

Peeling off the tapes and insulation sheets

1. Turn the back of module up and place it on a flat surface that is free of foreign objects.  
Make sure no dirt on the face to protect the surface of the LCD module from damage.  
Put a protection sheet (e.g. soft cloth) on the face.
2. In the order (1), (2), remove two bezel tape and the tape for fixing insulation sheet (with the tape on the insulation side attached).

**CAUTION:** 1. Be careful not to damage the FPC, PCB, B/L reflection sheet.  
2. Do not remove the insulation sheet to reuse it.  
3. Do not damage the TAB and PCB when removing the double –sided tape of the insulation sheet.

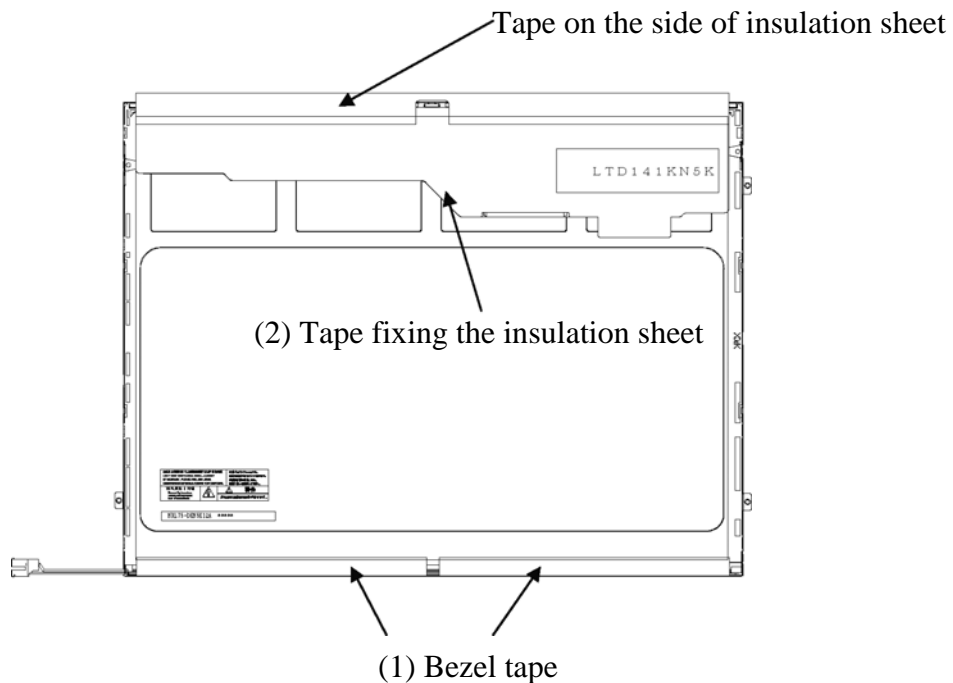


Figure 4-49 Replacing 14.1 Inch TMD fluorescent lamp (1)

## Removing the screws

1. Spread out the insulation sheet without detaching it from the side of the bezel.
2. Remove the four screws (1).

**CAUTION:** 1. To unfasten the screws, use an insert bit of point size 0 for Philips screwdrivers.

2. Do not remove the insulation sheet to reuse it.

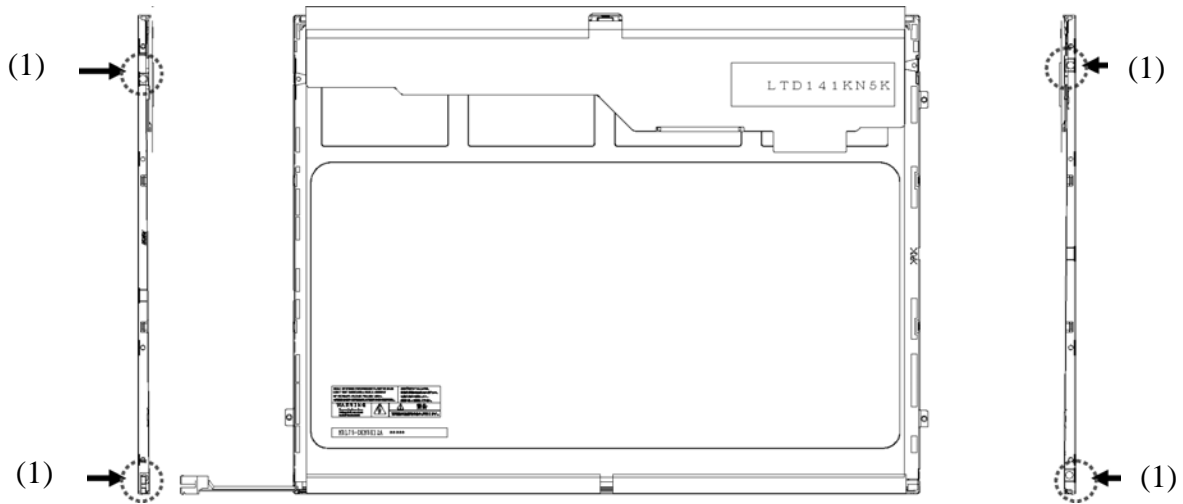


Figure 4-50 Replacing 14.1 Inch TMD fluorescent lamp (2)

## Removing the bezel

1. Without removing the insulation tape, turn the face of module up.
2. Release the four latches of the bezel and frame (two positions on each side). With holding up the bezel from the lower side (FL lamp side), release the three latches on the top to remove the bezel from the cell. (The bezel is reused.)

**CAUTION:** 1. Do not damage the latches and FPC.  
2. When removing the bezel, be careful not to deform the bezel.

Release the three latches on the top to remove the bezel from the cell.

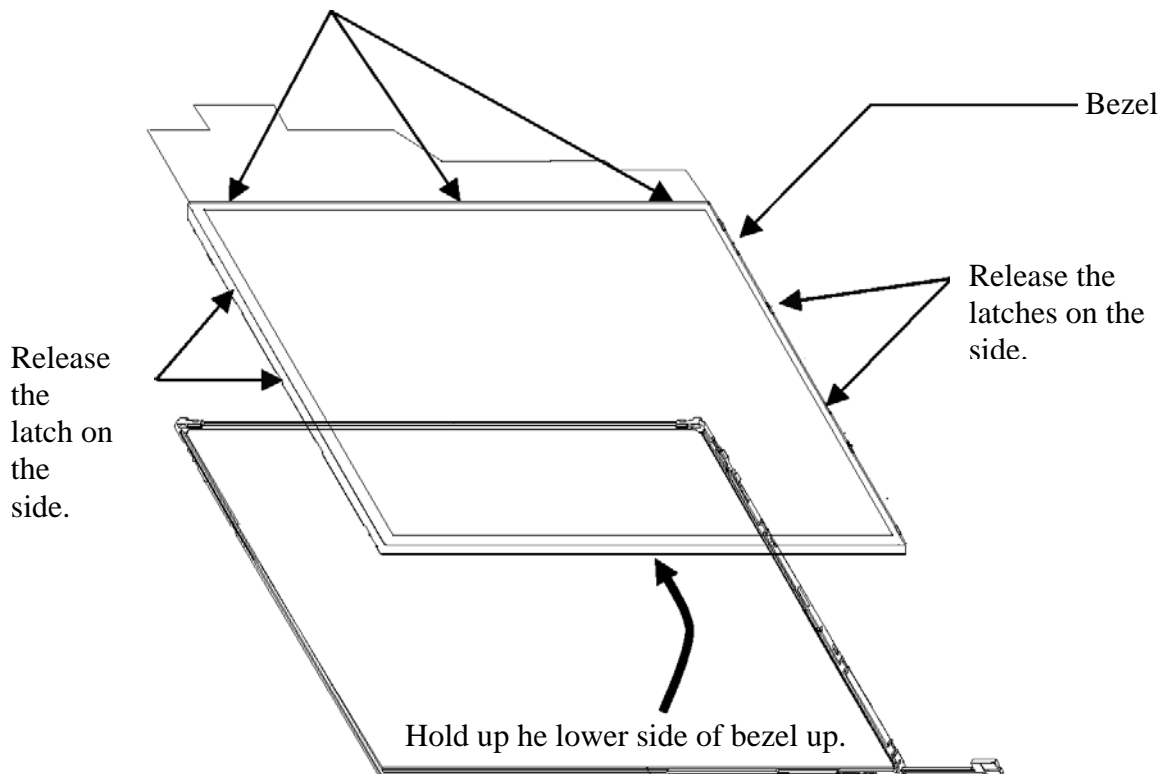


Figure 4-51 Replacing 14.1 Inch TMD fluorescent lamp (3)

## Opening the PCB

1. Spread out the PCB horizontally.

**CAUTION:** Be careful not to damage the FPC.

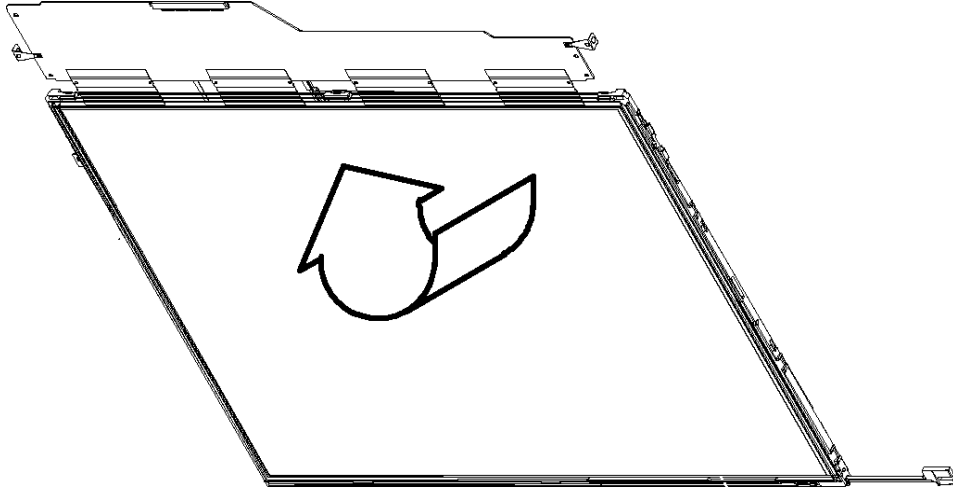


Figure 4-52 Replacing 14.1 Inch TMD fluorescent lamp (4)



## Removing the cell with PCB

1. Remove the cell with PCB from the backlight unit as shown bellow.
2. Completely remove the double-sided tape remaining on the reverse side of the cell.

**CAUTION:** 1. A portion of the upper side of cell is adhered to the frame with the double-sided tape. Remove the cell gently, taking care not to damage it.  
2. Do not remove the ray-shield tape on the upper, lower, right and left of face and back of cell.  
3. Be careful not to damage the FPC.

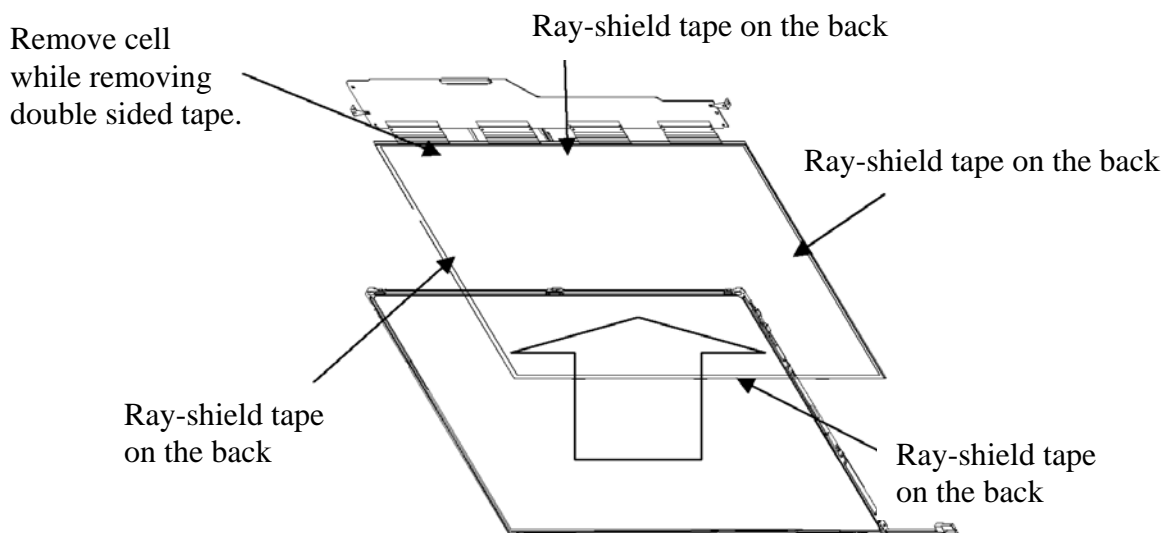


Figure 4-53 Replacing 14.1 Inch TMD fluorescent lamp (5)

### Assembling Fluorescent lamp

Check of the backlight replaced

1. Check the following items

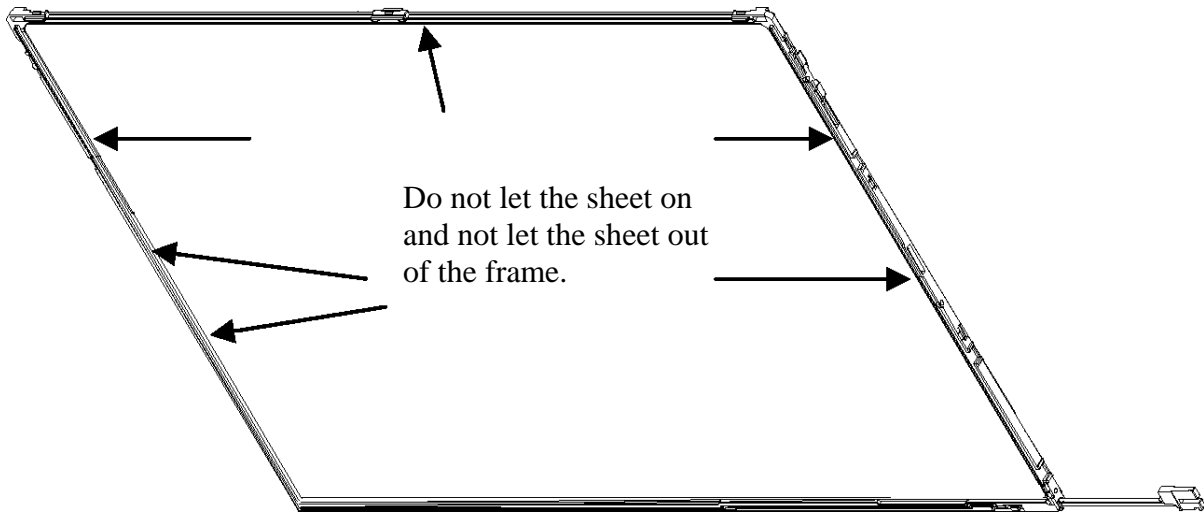


Figure 4-54 Replacing 14.1 Inch TMD fluorescent lamp (6)

## Assembling the cell with PCB

1. Remove the parting paper from the double-sided tape on the backlight unit.
2. Turn the backlight on.
3. Check that the backlight is free of dust, foreign objects, or damage. Perform this check also for the reverse side of the cell. Then install the cell with PCB in the backlight unit.

**CAUTION:** 1. Align the top left corner of the cell with the corresponding corner of the backlight unit.  
2. Be careful not to damage the FPC.

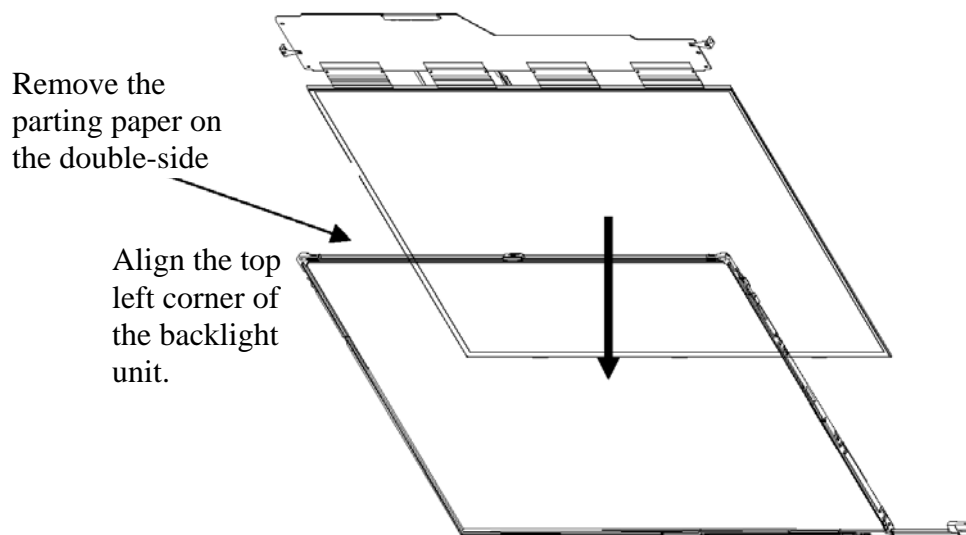


Figure 4- 55 Replacing 14.1 Inch TMD fluorescent lamp (7)

## Folding the FPC/PCB

1. Fold down the FPC (PCB) toward the reverse side of the backlight unit.

**CAUTION:** 1. Be careful not to damage the FPC.  
2. The screw hole shall be seen.

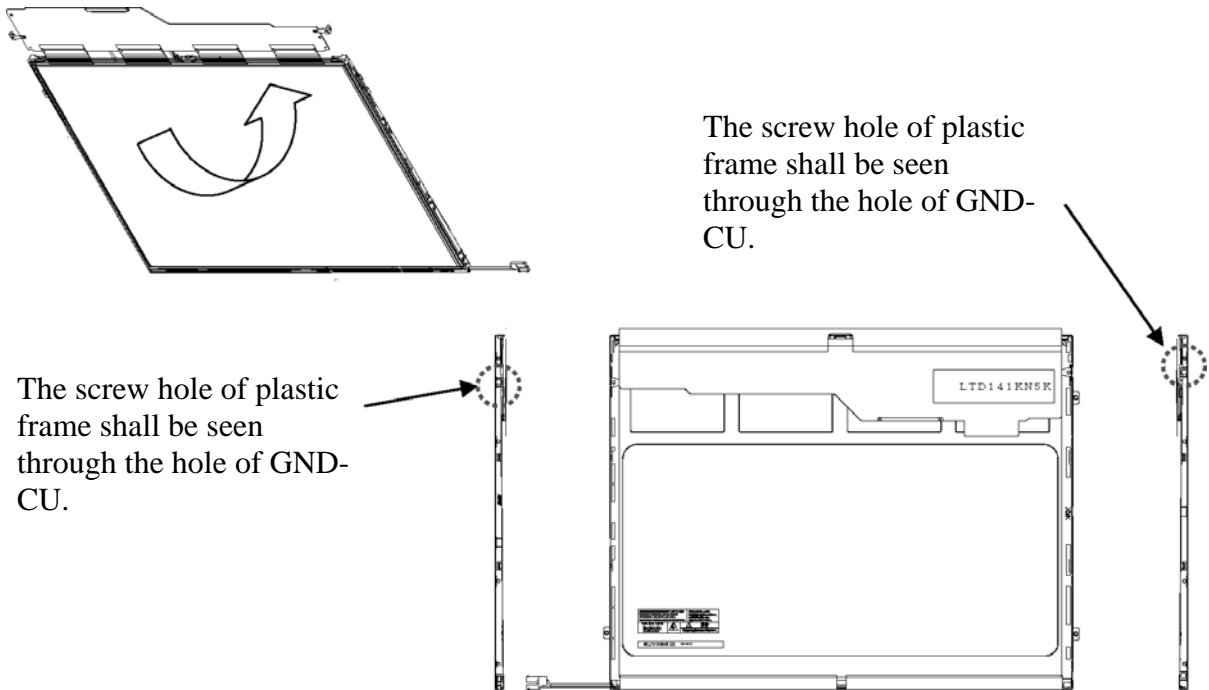


Figure 4-56 Replacing 14.1 Inch TMD fluorescent lamp (8)

## Setting the bezel

1. Fit the bezel into the frame from the lamp side. ((1) in the bellow figure)
2. Hook the four (two positions on each side) latches on the side. ((2) in the bellow figure)
3. Fit the bezel hooking the three latches on the upper side (FPC side). ((3) in the bellow figure)

**CAUTION:** Be careful not to damage the cell, FPC and B/L.

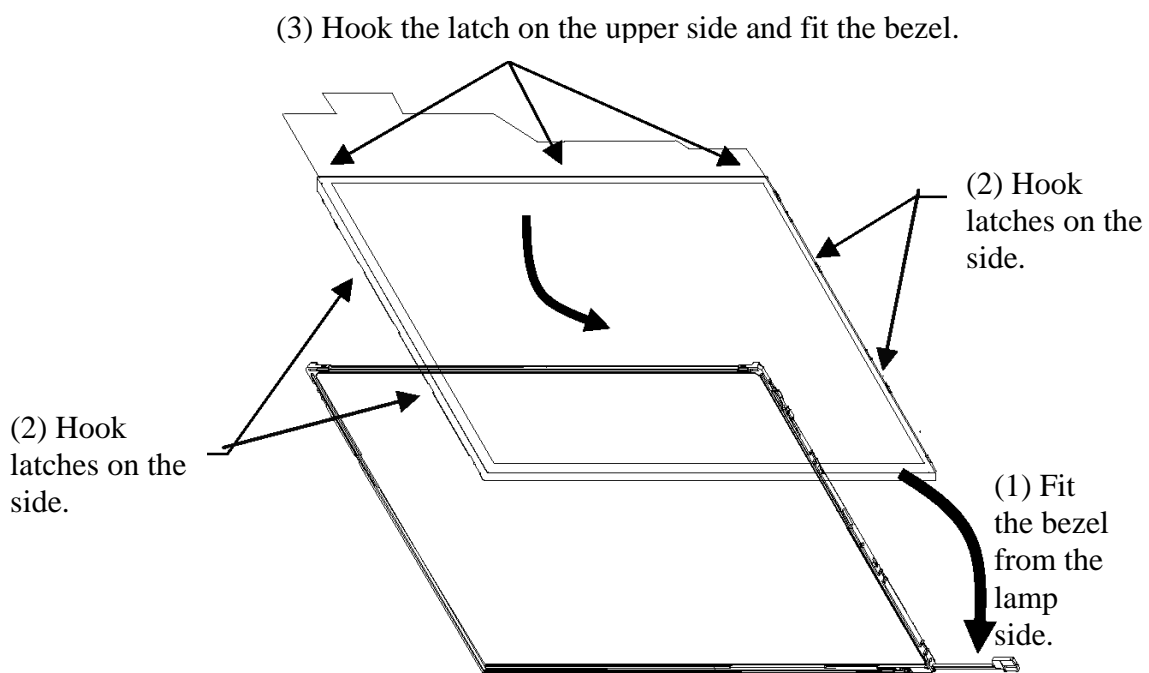


Figure 4-57 Replacing 14.1 Inch TMD fluorescent lamp (9)

Fasten screws of the PCB and bezel

1. Fasten four screws. ((1) in the bellow figure)

**CAUTION:** 1. The tightening torque must be  $0.176\text{ N m}$  ( $1.8\text{kgf}\cdot\text{cm}$ ) for all the screws.  
2. Use an insert bit of point size 0 for the Philips screwdrivers.

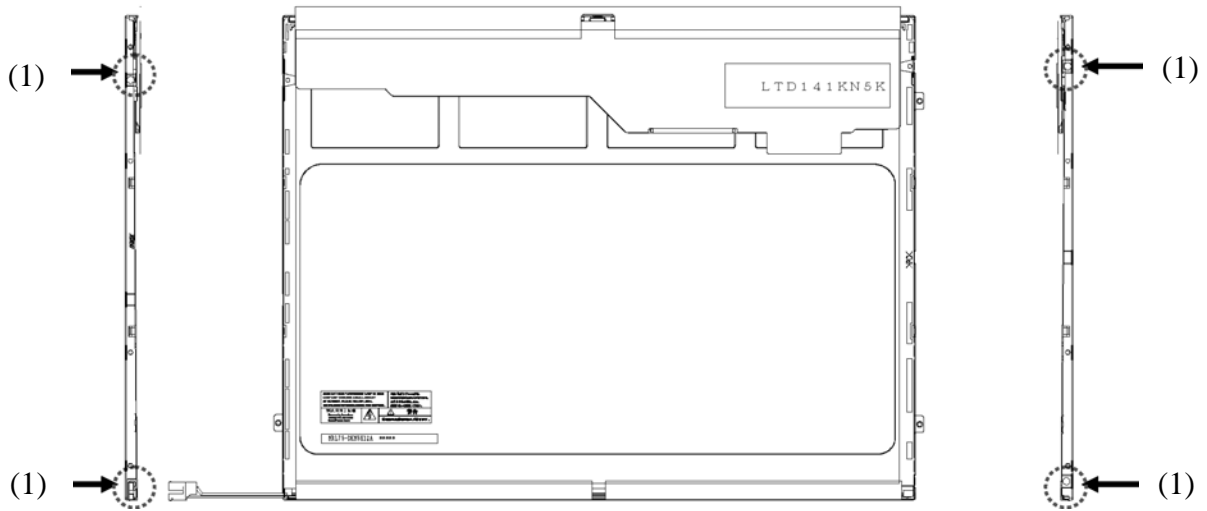


Figure 4-58 Replacing 14.1 Inch TMD fluorescent lamp (10)

Attaching the tapes and insulation sheet

1. Attach the double sided-tape of PCB insulation sheet.
2. Attach the tape for fixing insulation sheet and two bezel tapes.

**CAUTION:** When attaching tape and insulation sheet, be careful not to damage the PCB, cell and B/L.

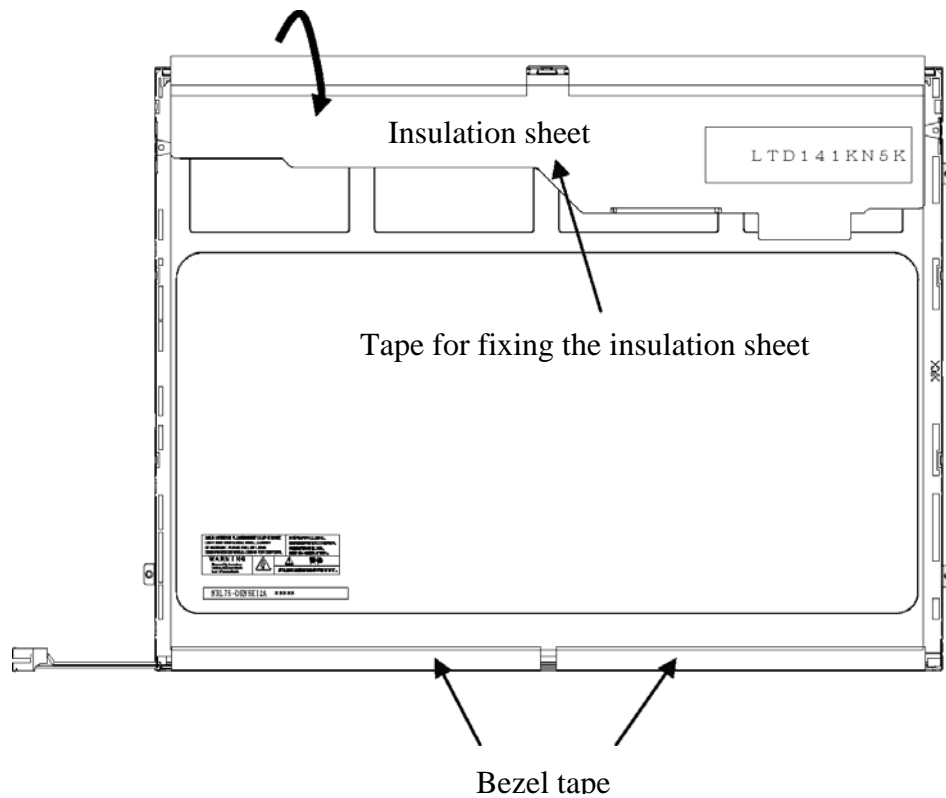


Figure 4-59 Replacing 14.1 Inch TMD fluorescent lamp (11)

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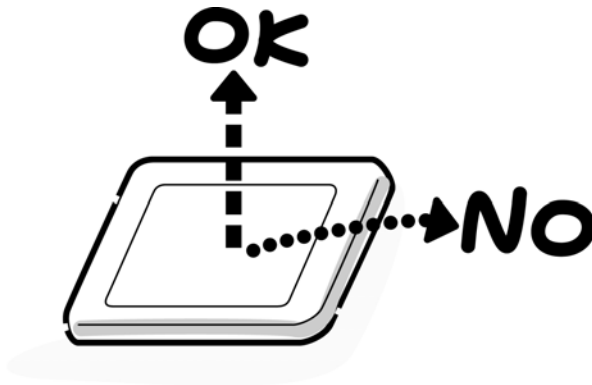
## Appendix A Handling the LCD Module

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### Precautions for handling the LCD module

The LCD module can be easily damaged during assembly or disassembly. Observe the following precautions when handling the LCD module:

1. When installing the LCD module in the LCD cover, be sure to seat it so that it is properly aligned and maximum visibility of the display is maintained.



2. Be careful to align the holes at the four corners of the LCD module with the corresponding holes in the LCD cover before securing the module with screws. Do not force the module into place, because stress can affect its performance.

Also, the panel's polarized surface is easily scarred, so be careful when handling it.





3. If the panel's surface gets dirty, wipe it with cotton or a soft cloth. If it is still dirty, try breathing on the surface to create a light condensate and wipe it again.

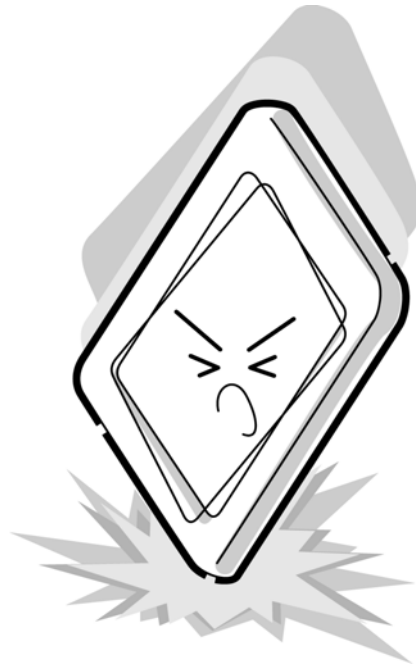
If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel.



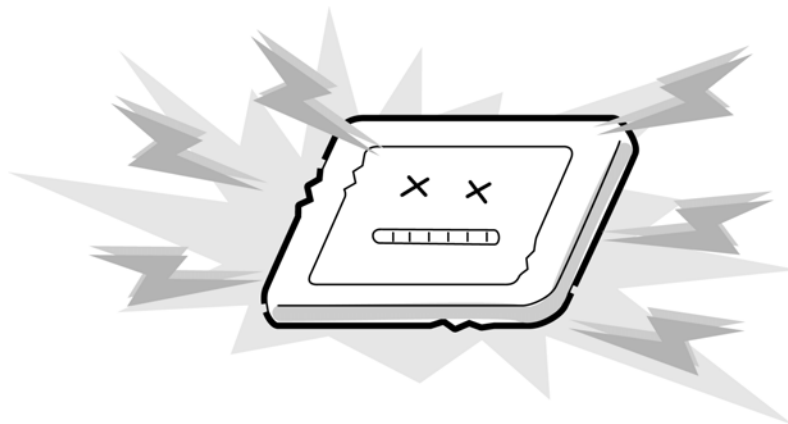
4. If water or other liquid is left on the panel's surface for a long period, it can change the screen's tint or stain it. Be sure to quickly wipe off any liquid.



5. Glass is used in the panel, so be careful not to drop it or let it strike a hard object, which could cause breakage or cracks.



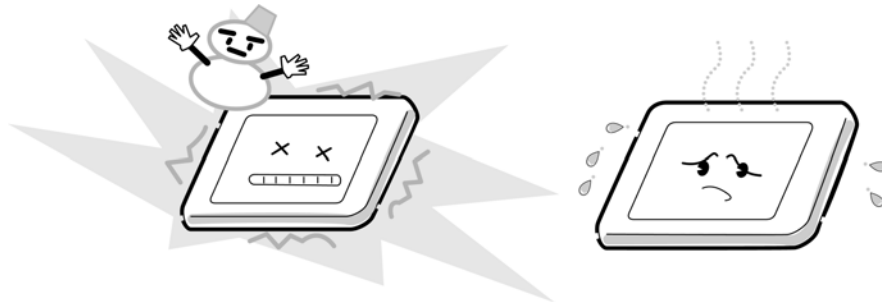
6. CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle ground when handling the module.



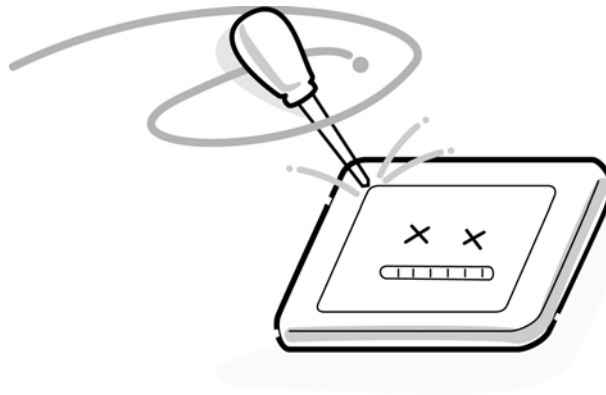
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.



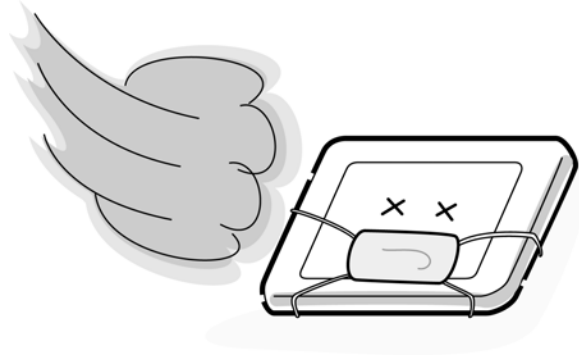
8. Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.



9. Do not disassemble the LCD module. Disassembly can cause malfunctions.



10. If you transport the module, do not use packing material that contains epoxy resin (amine) or silicon glue (alcohol or oxime). These materials can release gas that can damage the panel's polarization.





# Appendix B Board Layout

## B.1 System Board Front View

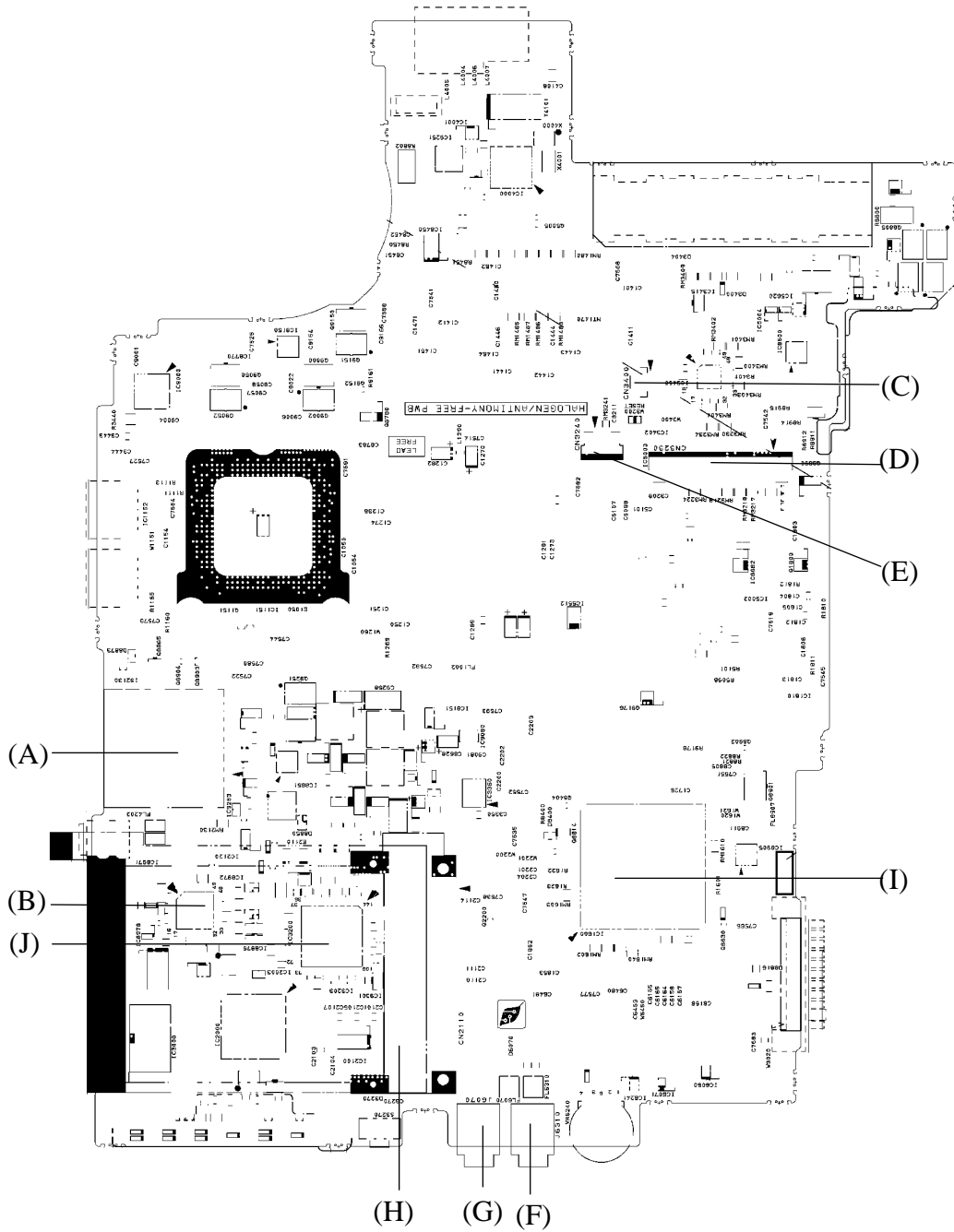


Figure B-1 System board layout (front)

Table B-1 System board (front)

Mark	Number	Part's name
(A)	IS2130	SD card slot
(B)	IC8972	PSC
(C)	CN3400	Debug port (D port) connector
(D)	CN3230	Keyboard connector
(E)	CN3240	Touch pad connector
(F)	J6310	Headphone jack
(G)	J6070	External microphone jack
(H)	CN2110	PC card connector
(I)	IC1600	ICH6-M
(J)	IC3200	EC/KBC



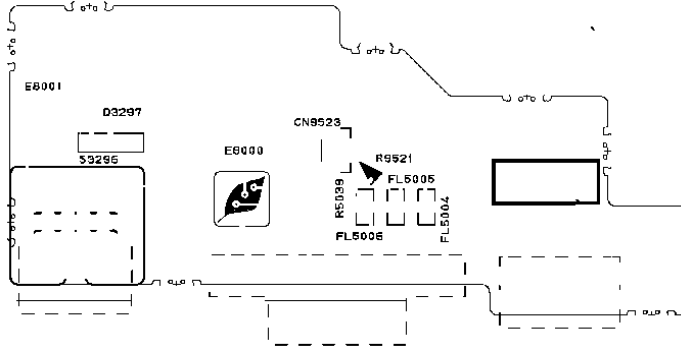


Table B-2 System board (back)

Mark	Number	Name
(A)	CN4611	USB connector 2
(B)	CN4610	USB connector 1
(C)	CN2200	Mini PCI connector
(D)	CN4200	IEEE1394 connector
(E)	CN1900	HDD I/F connector
(F)	CN6150	Speaker connector
(G)	CN6060	Internal microphone (left) connector
(H)	CN6061	Internal microphone (right) connector
(I)	CN3000	MDC connector
(J)	CN8810	Battery connector
(K)	IC1200	AlvisioPM
(L)	CN9990	RTC battery connector
(M)	CN8770	Fan1 connector
(N)	CN4612	USB connector 3
(O)	CN1801	Selectable bay connector
(P)	CN5501	LCD connector
(Q)	CN9502	CN board I/F connector
(R)	CN2300	Docking connector
(S)	CN1440, CN1460	Memory connector
(T)	CN3280	Panel sensor connector
(U)	CN3001	RJ11 relay connector
(V)	J4100	Network jack
(W)	CN9540	Digitizer connector
(X)	CN8800	DC IN connector
(Y)	CN8770	FAN0 connector
(Z)	IS1050	CPU

### B.3 CN Board Front and Back View

<Front layout>



<Back layout>

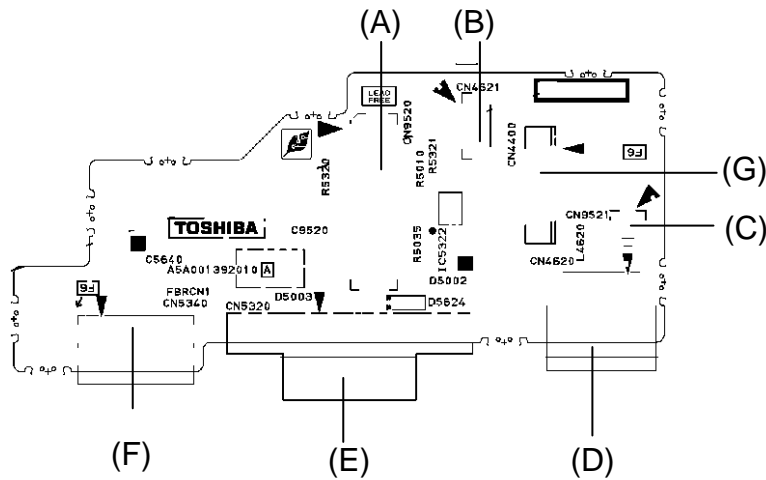


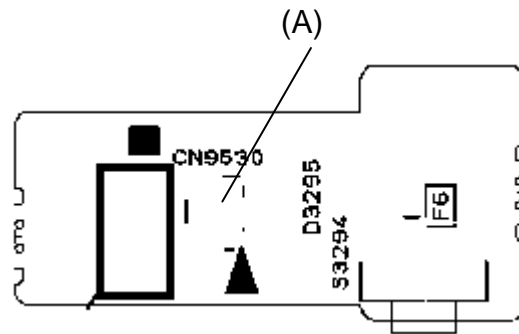
Figure B-3 CN board layout

Table B-3 CN Board

Mark	Number	Name
(A)	CN9520	System board I/F connector
(B)	CN4621	USB 1 relay connector
(C)	CN9521	QI board I/F connector
(D)	CN4620	USB 2 connector
(E)	CN5320	CRT connector
(F)	CN5340	S-VIDEO connector
(G)	CN4400	Bluetooth connector

### B.4 QI Board Front and Back View

<Front layout>



<Back layout>

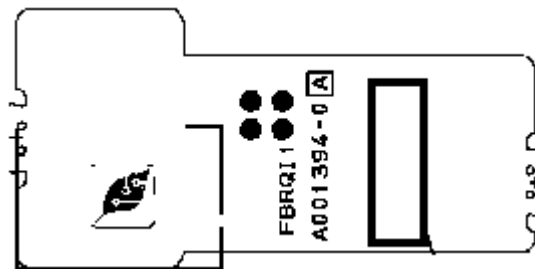


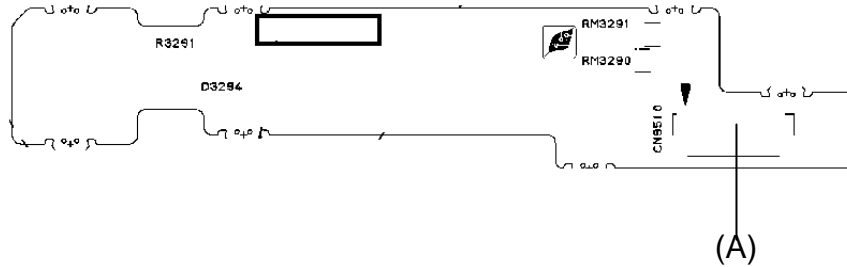
Figure B-4 QI Board layout

Table B-4 QI Board

Mark	Number	Name
(A)	CN9530	CN board I/F connector

### B.5 SW Board Front and Back View

<Front layout>



<Back layout>

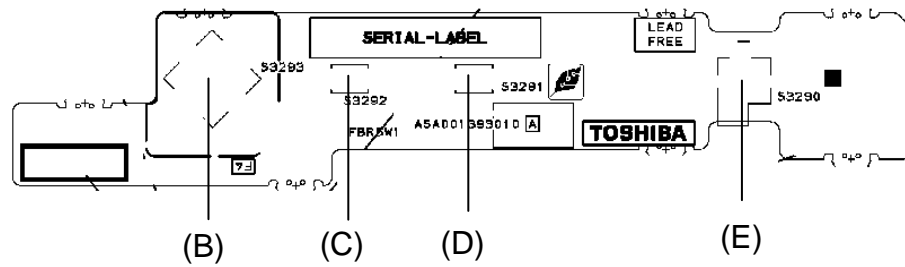


Figure B-5 SW Board layout

Table B-5 SW Board

Mark	Number	Name
(A)	CN9510	System board I/F connector
(B)	S3293	Direction button
(C)	S3292	ESC button
(D)	S3291	SAS button
(E)	S3290	POWER-ON switch



## Appendix C Pin Assignment

### System Board

#### C.1 CN1440 Memory 1 connector (200-pin)

Table C-1 Memory 1 connector (200-pin) (1/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	MRREF-B0V	-	2	GND	-
3	GND	-	4	BDQ05-B1P	I/O
5	BDQ07-B1P	I/O	6	BDQ04-B1P	I/O
7	BDQ06-B1P	I/O	8	GND	-
9	GND	-	10	BDM0-B1P	I/O
11	BDQS0-B1N	I/O	12	GND	-
13	BDQS0-B1P	I/O	14	BDQ01-B1P	I/O
15	GND	-	16	BDQ00-B1P	I/O
17	BDQ03-B1P	I/O	18	GND	-
19	BDQ02-B1P	I/O	20	BDQ12-B1P	I/O
21	GND	-	22	BDQ13-B1P	I/O
23	BDQ11-B1P	I/O	24	GND	-
25	BDQ09-B1P	I/O	26	BDM1-B1P	I/O
27	GND	-	28	GND	-
29	BDQS1-B1N	I/O	30	MCK3-B1P	O
31	BDQS1-B1P	I/O	32	MCK3-B1N	O
33	2R5-B2V	-	34	GND	-
35	BDQ09-B1P	I/O	36	BDQ15-B1P	I/O
37	BDQ14-B1P	I/O	38	BDQ10-B1P	I/O
39	GND	-	40	GND	-
41	GND	-	42	GND	-
43	BDQ16-B1P	I/O	44	BDQ21-B1P	I/O
45	BDQ17-B1P	-	46	BDQ17-B1P	I/O
47	GND	-	48	GND	-
49	BDQS2-B1N	I/O	50	NC	-
51	BDQS2-B1P	I/O	52	BDM2-B1P	I/O
53	GND	-	54	GND	-
55	BDQ23-B1P	I/O	56	BDQ19-B1P	I/O

Table C-1 Memory 1 connector (200-pin)(2/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
57	BDQ22-B1P	I/O	58	BDQ20-B1P	I/O
59	GND	-	60	GND	-
61	BDQ30-B1P	I/O	62	ADQ24-B1P	I/O
63	BDQ28-B1P	I/O	64	BDQ25-B1P	I/O
65	GND	-	66	GND	-
67	BDM3-B1P	I/O	68	BDQS3-B1N	I/O
69	NC	-	70	BDQS3-B1P	I/O
71	GND	-	72	GND	-
73	BDQ26-B1P	I/O	74	BDQ29-B1P	I/O
75	BDQ27-B1P	I/O	76	BDQ31-B1P	I/O
77	GND	-	78	GND	-
79	MCKE2-B1P	O	80	MCKE3-B1P	O
81	1R8-B1V	-	82	1R8-B1V	-
83	NC	-	84	NC	-
85	BBS2-B1P	O	86	NC	-
87	1R8-B1V	-	88	1R8-B1V	-
89	BMA12-B1P	O	90	BMA11-B1P	O
91	BMA09-B1P	O	92	BMA07-B1P	O
93	BMA08-B1P	O	94	BMA06-B1P	O
95	1R8-B1V	-	96	1R8-B1V	I
97	BMA05-B1P	O	98	BMA04-B1P	O
99	BMA03-B1P	O	100	BMA02-B1P	O
101	BMA01-B1P	O	102	BMA00-B1P	O
103	1R8-B1V	-	104	1R8-B1V	-
105	BMA10-B1P	O	106	BBS1-B1P	O
107	BBS0-B1P	O	108	BRAS-B1N	I
109	BWE-B1N	I	110	MCS2-B1N	O
111	1R8-B1V	-	112	1R8-B1V	-
113	BCAS-B1N	O	114	MODT2-B1P	O
115	MCS3-B1N	O	116	BMA13-B1P	I/O
117	1R8-B1V	-	118	1R8-B1V	-
119	MODT3-B1P	O	120	NC	-
121	GND	-	122	GND	-
123	BDQ32-B1P	I/O	124	BDQ36-B1P	I/O
125	BDQ33-B1P	I/O	126	BDQ37-B1P	I/O
127	GND	-	128	GND	-

Table C-1 Memory 1 connector (200-pin) (3/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
129	BDQS4-B1N	I/O	130	BDM4-B1P	O
131	BDQS4-B1P	I/O	132	GND	-
133	GND	-	134	BDQ38-B1P	I/O
135	BDQ34-B1P	I/O	136	ADQ39-B1P	I/O
137	BDQ35-B1P	I/O	138	GND	-
139	GND	-	140	BDQ44-B1P	I/O
141	BDQ40-B1P	I/O	142	BDQ45-B1P	I/O
143	BDQ41-B1P	I/O	144	GND	-
145	GND	-	146	BDQS5-B1N	I/O
147	BDM5-B1P	O	148	BDQS5-B1P	I/O
149	GND	-	150	GND	-
151	BDQ43-B1P	I/O	152	BDQ46-B1P	I/O
153	BDQ42-B1P	I/O	154	BDQ47-B1P	I/O
155	GND	-	156	GND	-
157	BDQ48-B1P	I/O	158	BDQ52-B1P	I/O
159	BDQ54-B1P	I/O	160	BDQ53-B1P	I/O
161	GND	-	162	GND	-
163	NC	-	164	MCK4-B1P	O
165	GND	-	166	MCK4-B1N	O
167	BDQS6-B1N	I/O	168	GND	-
169	BDQS6-B1P	I/O	170	ADM6	O
171	GND	-	172	GND	-
173	BDQ51-B1P	I/O	174	BDQ50-B1P	I/O
175	BDQ5%-B1P	I/O	176	BDQ49-B1P	I/O
177	GND	-	178	GND	-
179	BDQ57-B1P	I/O	180	BDQ56-B1P	I/O
181	BDQ60-B1P	I/O	182	BDQ61-B1P	I/O
183	GND	-	184	GND	-
185	BDM7-B1P	O	186	BDQS7-B1N	I/O
187	GND	-	188	BDQS7-B1P	I/O
189	BDQ58-B1P	I/O	190	GND	-
191	BDQ59-B1P	I/O	192	BDQ62-B1P	I/O
193	GND	-	194	ADQ63-B1P	I/O
195	SMBDAT-P3P	I/O	196	GND	-
197	SMBCLK-P3P	I/O	198	GND	-
199	P3V	-	200	GND	-
1T	GND	-	2T	GND	-



**C.2 CN1460 Memory 2 connector (200-pin)***Table C-2 Memory 2 connector (200-pin)(1/3)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	MRREF-B0V	-	2	GND	-
3	GND	-	4	ADQ04-B1P	I/O
5	ADQ00-B1P	I/O	6	ADQ05-B1P	I/O
7	ADQ01-B1P	I/O	8	GND	-
9	GND	-	10	ADM0-B1P	I/O
11	ADQS0-B1N	I/O	12	GND	-
13	ADQS0-B1P	I/O	14	ADQ02-B1P	I/O
15	GND	-	16	ADQ07-B1P	I/O
17	ADQ03-B1P	I/O	18	GND	-
19	ADQ06-B1P	I/O	20	ADQ12-B1P	I/O
21	GND	-	22	ADQ13-B1P	I/O
23	ADQ08-B1P	I/O	24	GND	-
25	ADQ09-B1P	I/O	26	ADM1-B1P	I/O
27	GND	-	28	GND	-
29	ADQS1-B1N	I/O	30	MCK0-B1P	O
31	ADQS1-B1P	I/O	32	MCK0-B1N	O
33	2R5-B2V	-	34	GND	-
35	ADQ14-B1P	I/O	36	ADQ10-B1P	I/O
37	ADQ15-B1P	I/O	38	ADQ11-B1P	I/O
39	GND	-	40	GND	-
41	GND	-	42	GND	-
43	ADQ16-B1P	I/O	44	ADQ20-B1P	I/O
45	ADQ17-B1P	-	46	ADQ21-B1P	I/O
47	GND	-	48	GND	-
49	ADQS2-B1N	I/O	50	NC	-
51	ADQS2-B1P	I/O	52	ADM2-B1P	I/O
53	GND	-	54	GND	-
55	ADQ23-B1P	I/O	56	ADQ19-B1P	I/O
57	ADQ22-B1P	I/O	58	ADQ18-B1P	I/O
59	GND	-	60	GND	-
61	ADQ24-B1P	I/O	62	ADQ29-B1P	I/O
63	ADQ25-B1P	I/O	64	ADQ28-B1P	I/O
65	GND	-	66	GND	-
67	ADM3-B1P	I/O	68	ADQS3-B1N	I/O

Table C-2 Memory 2 connector (200-pin)(2/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
69	NC	-	70	ADQS3-B1P	I/O
71	GND	-	72	GND	-
73	ADQ27-B1P	I/O	74	ADQ30-B1P	I/O
75	BDQ26-B1P	I/O	76	ADQ31-B1P	I/O
77	GND	-	78	GND	-
79	MCKE0-B1P	O	80	MCKE1-B1P	O
81	1R8-B1V	-	82	1R8-B1V	-
83	NC	-	84	NC	-
85	ABS2-B1P	O	86	NC	-
87	1R8-B1V	-	88	1R8-B1V	-
89	AMA12-B1P	O	90	AMA11-B1P	O
91	AMA09-B1P	O	92	AMA07-B1P	O
93	AMA08-B1P	O	94	AMA06-B1P	O
95	1R8-B1V	-	96	1R8-B1V	I
97	AMA05-B1P	O	98	AMA04-B1P	O
99	AMA03-B1P	O	100	AMA02-B1P	O
101	AMA01-B1P	O	102	AMA00-B1P	O
103	1R8-B1V	-	104	1R8-B1V	-
105	AMA10-B1P	O	106	ABS1-B1P	O
107	ABS0-B1P	O	108	ARAS-B1N	I
109	AWE-B1N	I	110	MCS0-B1N	O
111	1R8-B1V	-	112	1R8-B1V	-
113	ACAS-B1N	O	114	MODT0-B1P	O
115	MCS1-B1N	O	116	AMA13-B1P	I/O
117	1R8-B1V	-	118	1R8-B1V	-
119	MODT1-B1P	O	120	NC	-
121	GND	-	122	GND	-
123	ADQ32-B1P	I/O	124	ADQ36-B1P	I/O
125	ADQ33-B1P	I/O	126	ADQ37-B1P	I/O
127	GND	-	128	GND	-
129	ADQS4-B1N	I/O	130	ADM4-B1P	O
131	ADQS4-B1P	I/O	132	GND	-
133	GND	-	134	ADQ38-B1P	I/O
135	ADQ34-B1P	I/O	136	ADQ35-B1P	I/O
137	ADQ39-B1P	I/O	138	GND	-
139	GND	-	140	ADQ40-B1P	I/O

Table C-2 Memory 2 connector (200-pin )(3/3)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
141	ADQ45-B1P	I/O	142	ADQ44-B1P	I/O
143	ADQ41-B1P	I/O	144	GND	-
145	GND	-	146	ADQS5-B1N	I/O
147	ADM5-B1P	O	148	ADQS5-B1P	I/O
149	GND	-	150	GND	-
151	ADQ42-B1P	I/O	152	ADQ46-B1P	I/O
153	ADQ43-B1P	I/O	154	ADQ47-B1P	I/O
155	GND	-	156	GND	-
157	ADQ48-B1P	I/O	158	ADQ52-B1P	I/O
159	ADQ49-B1P	I/O	160	ADQ53-B1P	I/O
161	GND	-	162	GND	-
163	NC	-	164	MCK1-B1P	O
165	GND	-	166	MCK1-B1N	O
167	ADQS6-B1N	I/O	168	GND	-
169	ADQS6-B1P	I/O	170	ADM6-B1P	O
171	GND	-	172	GND	-
173	ADQ55-B1P	I/O	174	ADQ54-B1P	I/O
175	ADQ51-B1P	I/O	176	ADQ50-B1P	I/O
177	GND	-	178	GND	-
179	ADQ56-B1P	I/O	180	ADQ60-B1P	I/O
181	ADQ57-B1P	I/O	182	ADQ61-B1P	I/O
183	GND	-	184	GND	-
185	ADM7-B1P	O	186	ADQS7-B1N	I/O
187	GND	-	188	ADQS7-B1P	I/O
189	ADQ58-B1P	I/O	190	GND	-
191	ADQ59-B1P	I/O	192	ADQ52-B1P	I/O
193	GND	-	194	ADQ53-B1P	I/O
195	SMBDAT-P3P	I/O	196	GND	-
197	SMBCLK-P3P	I/O	198	GND	-
199	P3V	-	200	GND	-
1T	GND	-	2T	GND	-

**C.3 CN1801 Select bay I/F connector (72-pin)***Table C-3 Select bay I/F connector (72-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	37	GND	-
2	GND	-	38	PIORDY-P3P	O
3	N.C.	-	39	(CSEL)	-
4	N.C.	-	40	PDDACK	I
5	GND	-	41	GND	-
6	N.C.	-	42	IRQ15	O
7	IDRSTB-P5N	I	43	N.C.	-
8	GND	-	44	PDA1-P3P	I
9	GND	-	45	S8-P5V	I
10	PDD07-P3P	I/O	46	S8-P5V	I
11	PDD08-P3P	I/O	47	S8-P5V	I
12	PDD06-P3P	I/O	48	PDA0-P3P	I
13	PDD09-P3P	I/O	49	PDA2-P3P	I
14	PDD05-P3P	I/O	50	PDCS1-P3N	I
15	PDD10-P3P	I/O	51	PDCS3-P3N	I
16	GND	-	52	CDRLED-P5N	O
17	GND	-	53	GND	-
18	PDD04-P3P	I/O	54	MSSTS2-S3N	I
19	PDD11-P3P	I/O	55	MSSTS1-S3N	I
20	PDD03-P3P	I/O	56	MSSTS0-S3N	I
21	PDD12-P3P	I/O	57	GND	-
22	PDD02-P3P	I/O	58	DBT20V-S5N.	O
23	PDD13-P3P	I/O	59	PSDA-S5P.	I
24	S8-P5V	I	60	BT2VD	-
25	S8-P5V	I	61	PSCL-S5P.	O
26	PDD01-P3P	I/O	62	BTMP2	I
27	PDD14-P3P	I/O	63	CDCHG2-S5P	I
28	PDD00-P3P	I/O	64	GND	-
29	PDD15-P3P	I/O	65	GND	-
30	GND	-	66	N.C.	-
31	GND	-	67	GND	-
32	PDDREQ-P3P	O	68	N.C.	-
33	GND	-	69	GND	-
34	PDIOW-P3N	I	70	GND	-
35	GND	-	71		
36	PDIOR-P3N	I	72	PVBAT2	-

## C.4 CN1900 HDD I/F connector (11-pin)

Table C-4 HDD I/F connector (11-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	SATAT0-P3P	O	2	SATAT0-P3N	O
3	GND	-	4	SATAR0-P3N	I
5	SATAR0-P3P	I	6	GND	-
7	P3V	-	8	GND	-
9	P5V	-	10	GND	-
11	GND	-			
1T	GND	-	2T	GND	-
3T	GND	-	4T	GND	-

## C.5 CN2110 PC card I/F connector (70-pin)

Table C-5 PC card I/F connector (70-pin)) (1/2)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	ACAD00-EYP	I/O
3	ACAD01-EYP	I/O	4	ACAD03-EYP	I/O
5	ACAD05-EYP	I/O	6	ACAD07-EYP	I/O
7	ACCBEO-EYN	I/O	8	ACAD09-EYP	I/O
9	ACAD11-EYP	I/O	10	ACAD12-EYP	I/O
11	ACAD14-EYP	I/O	12	ACCBE1-EYN	I/O
13	ACPAR-EYP	I/O	14	ACPERR-EYN	I/O
15	ACGNT-EYN	I/O	16	ACINT-EYN	I/O
17	MCVCCA-EYV	I/O	18	MCVPPA-EYV	I/O
19	ACCLK-EYP	I/O	20	ACIRDY-EYN	I/O
21	ACCBE2-EYN	I/O	22	ACAD18-EYP	I/O
23	ACAD20-EYP	I/O	24	ACAD21-EYP	I/O
25	ACAD22-EYP	I/O	26	ACAD23-EYP	I/O
27	ACAD24-EYP	I/O	28	ACAD25-EYP	I/O
29	ACAD26-EYP	I/O	30	ACAD27-EYP	I/O
31	ACAD29-EYP	I/O	32	ACD02-EYP	I/O
33	ACCLKR-EYN	I/O	34	GND	-

Table C-5 PC card I/F connector (70-pin) (2/2)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
35	GND	-	36	ACCD1-E3N	I/O
37	ACAD02-EYP	I/O	38	ACAD04-EYP	I/O
39	ACAD06-EYP	I/O	40	ACD14-EYP	I/O
41	ACAD08-EYP	I/O	42	ACAD10-EYP	I/O
43	ACVS1-E3P	I/O	44	ACAD13-EYP	I/O
45	ACAD15-EYP	I/O	46	ACAD16-EYP	I/O
47	ACA18-EYP	I/O	48	ACLOCK-EYN	I/O
49	ACSTOP-EYN	I/O	50	ACDEVS-EYN	I/O
51	MCVCCA-EYV	I	52	MCVPPA-EYV	I/O
53	ACTRDY-EYN	I/O	54	ACFRAM-EYN	I/O
55	ACAD17-EYP	I/O	56	ACAD19-EYP	I/O
57	ACVS2-E3P	I/O	58	ACRST-EYN	I/O
59	ACSERR-EYN	I/O	60	ACREQ-EYN	I/O
61	ACCBE3-EYN	I/O	62	ACAUDI-EYP	O
63	ACSTSC-EYP	O	64	ACAD28-EYP	I/O
65	ACAD30-EYP	I/O	66	ACAD31-EYP	I/O
67	ACCD2-E3N	O	68	GND	-
69	GND	-	70	GND	-

## C.6 IS2130 SD card I/F connector (12-pin)

Table C-6 SD card I/F connector (12-pin))

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	SDAT3-E3P	I/O	2	SDCMD-E3P	I/O
3	GND	-	4	SD-E3V	I
5	SDCLK-E3P	I	6	GND	-
7	SDAT0-E3P	I/O	8	SDAT1-E3P	I/O
9	SDAT2-E3P	I/O	10	SDCD-E3N	O
11	SDWP-E3P	O	12	GND	-

**C.7 CN2200 Mini PCI I/F connector (124-pin)***Table C-7 Mini PCI I/F connector (124-pin) (1/2)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	N.C.	-	2	N.C.	-
3	N.C.	-	4	N.C.	-
5	N.C.	-	6	N.C.	-
7	N.C.	-	8	N.C.	-
9	N.C.	-	10	N.C.	-
11	N.C.	-	12	N.C.	-
13	WLON-S3N	I	14	N.C.	-
15	GND	-	16	N.C.	-
17	PIRQD-P3N	I	18	P5V	I
19	P3V	I	20	PIRQG-P3N	O
21	N.C.	-	22	N.C.	-
23	GND	-	24	E3V	I
25	X33MPC-P3P	I	26	PCIRS3-P3N	O
27	GND	-	28	P3V	I
29	PREQ2-P3N	I	30	PGNT2-P3N	O
31	P3V	I	32	GND	-
33	AD31-P3P	I/O	34	PME-S3N	O
35	AD29-P3P	I/O	36	N.C.	-
37	GND	-	38	AD30-P3P	I/O
39	AD27-P3P	I/O	40	P3V	I
41	AD25-P3P	I/O	42	AD28-P3P	I/O
43	N.C.	-	44	AD26-P3P	I/O
45	CBE3-P3N	I	46	AD24-P3P	I/O
47	AD23-P3P	I/O	48	AD21-P3P	I/O
49	GND	-	50	GND	-
51	AD21-P3P	I/O	52	AD22-P3P	I/O
53	AD19-P3P	I/O	54	AD20-P3P	I/O
55	GND	-	56	PAR-P3P	O
57	AD17-P3P	I/O	58	AD18-P3P	I/O
59	CBE2-P3N	I/O	60	AD16-P3P	I/O
61	IRDY-P3N	I/O	62	GND	-
63	P3V	I	64	FRAME-P3N	I/O
65	CLKRUN-P3N	I/O	66	TDRY-P3N	I/O
67	SERR-P3N	I/O	68	STOP-P3N	I/O
69	GND	-	70	P3V	I

Table C-7 Mini PCI I/F connector (124-pin) (2/2)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
71	PERR-P3N	I/O	72	DEVSEL-P3N	I/O
73	CBE1-P3N	I	74	GND	-
75	AD14-P3P	I/O	76	AD15-P3P	I/O
77	GND	-	78	AD13-P3P	I/O
79	AD12-P3P	I/O	80	AD11-P3P	I/O
81	AD10-P3P	I/O	82	GND	-
83	GND	-	84	AD09-P3P	I/O
85	AD08-P3P	I/O	86	CBE0-P3N	O
87	AD07-P3P	I/O	88	P3V	I
89	P3V	-	90	AD06-P3P	I/O
91	AD05-P3P	I/O	92	AD04-P3P	I/O
93	N.C.	-	94	AD02-P3P	I/O
95	AD03-P3P	I/O	96	AD00-P3P	I/O
97	P5V	I	98	N.C.	-
99	AD01-P3P	I/O	100	N.C.	-
101	GND	-	102	GND	-
103	N.C.	-	104	GND	-
105	N.C.	-	106	N.C.	-
107	N.C.	-	108	N.C.	-
109	N.C.	-	110	N.C.	-
111	N.C.	-	112	N.C.	-
113	GND	-	114	GND	-
115	N.C.	-	116	N.C.	-
117	GND	-	118	N.C.	-
119	GND	-	120	GND	-
121	N.C.	-	122	N.C.	-
123	N.C.	-	124	E3V	I



**C.8 CN2300 Docking I/F connector (240-pin)**

Table C-8 Docking I/F connector (240-pin) (1/4)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
A1	DSKDC	I	A2	GND	-
A3	DSKDC	I	A4	GND	-
1	DCOUT	I	2	DCOUT	I
3	DOCDT1-S3N	O	4	P5V	I
5	N.C.	-	6	N.C.	-
7	GND	-	8	PHYRST-E3N	I-
9	DPCONF-S5P	O	10	GND	-
11	GND	-	12	DDCACK-P3P	I/O
13	DRED-PXP	I	14	DGREEN-PXP	I
15	DBLUE-PXP	I	16	DVSYNC-P3P	I
17	(DVISC-P3P)	I/O	18	Reserved	-
19	GND	-	20	(DVI-PRTCT2)	-
21	(DVI-PRTCT1)	-	22	(DVITX2-P3P)	-
23	(DVITX2-P3N)	-	24	(DVITX1-P3P)	-
25	(DVITX1-P3N)	-	26	(DVITX0-P3P)	-
27	(DVITX0-P3N)	-	28	GND	-
29	GND	-	30	(DVITXC-P3P)	I
31	(DVITXC-P3N)	-	32	(DVIDET-S3N)	-
33	(DVIPD0)	-	34	Reserved	-
35	(QSWON-B3P)	-	36	(DIRQD-S3N)	-
37	GND	-	38	(PCM2SP-B3P)	-
39	(DPMRST-S3N)	-	40	(DADOO-P3P)	-
41	GND	-	42	(DADOO-P3P)	-
43	(DADO2-P3P)	-	44	(DADO6-P3P)	-
45	GND	-	46	(XDPCI-P3P)	-
47	(DAD09-P3P)	-	48	(DAD11-P3P)	-
49	GND	-	50	(DAD11-P3P)	-
51	(DAD15-P3P)	-	52	(DINTA-P3N)	-
53	VOID	-	54	VOID	-
55	BIDDP-PXP	I/O	56	BIDDN-PXN	I/O
57	VOID	-	58	VOID	-
59	MDMRNG-E3P	I/O	60	MDMTIP-E3P	I/O
61	DCOUT	-	62	DCOUT	-

Table C-8 Docking I/F connector (240-pin) (2/4)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
63	EJCTRQ-S3N	I/O	64	IF-P5V	I
65	(EXMSDT-P5P)	-	66	(EXKBDT-P5P)	-
67	GND	-	68	GND	-
69	DILSON-S3P	I/O	70	(NVPCNF-S3P)	O
71	GND	-	72	DDCADA-P3P	I/O
73	GND	-	74	GND	-
75	GND	-	76	DHSYNC-P3P	I
77	(DVISD-P3P)	-	78	(DVI_PRTCT3)	-
79	GND	-	80	(DVITX5-P3P)	-
81	(DVITX5-P3N)	-	82	(DVITX4-P3P)	-
83	(DVITX4-P3N)	-	84	(DVITX3-P3P)	-
85	(DVITX3-P3N)	-	86	(DVI16)	-
87	(DVI17)	-	88	GND	-
89	GND	-	90	(DOC_ON_LED1)	-
91	Reserved	-	92	(DOC_ON_LED2)	-
93	(DVIPD1)	-	94	(DVI_PRTCT4)	-
95	(DCADIO-S3P)	-	96	(DSMI-B3P)	-
97	GND	-	98	(DCKRUN-P3N)	-
99	(PME-S3P)	-	100	(DADO1-P3P)	-
101	GND	-	102	(DADO3-P3P)	-
103	(DADO5-P3P)	-	104	(DADO7-P3P)	-
105	GND	-	106	(DADO8-P3P)	-
107	(DAD10-P3P)	-	108	(DAD12-P3P)	-
109	GND	-	110	(DAD14-P3P)	-
111	(DCBE1-P3N)	-	112	(DPAR-P3P)	-
113	VOID	-	114	VOID	-
115	BIDCN-EXN	I/O	116	VOID	-
117	BIDCP-EXP	I/O	118	VOID	-
119	VOID	-	120	VOID	-
121	DCOUT	I	122	DCOUT	I
123	DSSCL-S5P	I/O	124	IF-P5V	I
125	M5V	I	126	DTPA-E3P	I/O
127	GND	-	128	DTPB-E3P	I/O
129	(USBON1-E5N)	-	130	(USBOC1-E5N)	-
131	GND	-	132	(USBON2-E5N)	I
133	(USBOC2-E5N)	-	134	SNDMUT-S3N	I
135	DMBCHG-S3P	O	136	DOUTL-PXP	I/O
137	DINL-PXP	I/O	138	DINR-PXN	I/O

Table C-8 Docking I/F connector (240-pin) (3/4)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
139	GND	-	140	PWRSW-S3N	O
141	(DCD-PYP)	-	142	(DSR-PYP)	-
143	(TXD-EYN)	-	144	(RING-PYP)	-
145	PE-P5P	O	146	PDB07-P5P	I/O
147	PDB06-P5P	I/O	148	GND	-
149	GND	-	150	PDB04-P5P	I/O
151	PDB01-P5P	I/O	152	PDB02-P5P	I/O
153	PDB00-P5P	I/O	154	STROB-P5N	I
155	(DPGNT-P3N)	-	156	(DAD30-P3P)	-
157	GND	-	158	(DAD28-P3P)	-
159	(DAD26-P3P)	-	160	(DAD24-P3P)	-
161	GND	-	162	(DIDSL-P3P)	-
163	(DAD22-P3P)	-	164	(DAD20-P3P)	-
165	GND	-	166	(DCBE0-P3N)	-
167	(DAD18-P3P)	-	168	(DAD16-P3P)	-
169	GND	-	170	(DCBE2-P3N)	-
171	(DTRDY-P3N)	-	172	(DSTOP-P3N)	-
173	GND	-	174	VOID	-
175	P3V	I	176	VOID	-
177	VOID	-	178	N.C.	-
179	BIDAP-PXP	O	180	BIDAN-PXN	O
181	DCOUT	I	182	DCOUT	I
183	DSSDA-S5P	I/O	184	IF-P5V	I
185	Reserved	-	186	DTPA-E3N	I/O
187	GND	-	188	DTPB-E3N	I/O
189	USBP1-S3P	I/O	190	USBP1-S3N	I/O
191	GND	-	192	USBP2-S3P	I/O
193	USBP2-S3N	I/O	194	DOUTR-PXP	I/O
195	DOUTR-PXN	-	196	DOUTL-PXN	I/O
197	DINL-PXN	-	198	DINR-PXP	I/O
199	GND	-	200	(RXD-PYN)	-
201	(RTS-EYP)	-	202	(CTS-PYP)	-
203	(DTR-EYP)	-	204	SELCT-P5P	O
205	BUSY-P5P	O	206	ACK-P5N	O
207	PDB05-P5P	I/O	208	GND	-
209	GND	-	210	PDB03-P5P	I/O
211	SLIN-P5N	I	212	PINIT-P5N	I

Table C-8 Docking I/F connector (240-pin) (4/4)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
213	ERROR-P5N	O	214	AUTFD-P5N	I
215	(DPREQ-P3N)	-	216	(DAD31-P3P)	-
217	GND	-	218	(DAD29-P3P)	-
219	(DAD27-P3P)	-	220	(DAD25-P3P)	-
221	GND	-	222	(DCBE23-P3N)	-
223	(DAD23-P3P)	-	224	(DAD21-P3P)	-
225	GND	-	226	(DCPCLR-P3P)	-
227	(DAD19-P3P)	-	228	(DAD17-P3P)	-
229	GND	-	230	(DFRAME-P3N)	-
231	(DIRDY-P3N)	-	232	(DDEVSL-P3N)	-
233	GND	-	234	ACT-P3N	O
235	LINK-P3N	O	236	DOCDT2-S3N	O
237	VOID	-	238	VOID	-
239	BIDBP-PXP	I	240	BIDBN-PXN	I

### C.9 CN3000 MDC I/F connector (30-pin)

Table C-9 MDC I/F connector (30-pin)

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	N.C.	-	2	GND	-
3	GND	-	4	N.C.	-
5	N.C.	-	6	N.C.	-
7	N.C.	-	8	GND	-
9	N.C.	-	10	N.C.	-
11	N.C.	-	12	N.C.	-
13	N.C.	-	14	N.C.	-
15	GND	-	16	E3V	I
17	E3V	I	18	N.C.	-
19	GND	-	20	GND	-
21	N.C.	-	22	M97SY2-P3P	I
23	M97OT2-P3P	I	24	N.C.	-
25	M97RS2-S3N	I	26	M97IN2-E3P	O
27	GND	-	28	GND	-
29	GND	-	30	X97BC2-P3P	I/O

**C.10 CN3230 Keyboard connector (34-pin)***Table C-10 Keyboard connector (34-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	NUMLED-P5N	I	2	ARWLED-P5N	I
3	CAPLED-P5N	I	4	P5V	I
5	KBSC00-S3N	O	6	KBSC01-S3N	O
7	KBSC02-S3N	O	8	KBSC03-S3N	O
9	KBSC04-S3N	O	10	KBSC05-S3N	O
11	KBSC06-S3N	O	12	KBRT00-S3N	O
13	KBSC07-S3N	O	14	KBSC08-S3N	O
15	KBSC09-S3N	O	16	KBRT01-S3N	O
17	KBRT02-S3N	O	18	KBRT03-S3N	O
19	KBSC10-S3N	O	20	KBSC11-S3N	O
21	KBRT04-S3N	O	22	KBRT05-S3N	O
23	KBSC12-S3N	O	24	KBSC13-S3N	O
25	KBRT06-S3N	O	26	KBRT07-S3N	O
27	KBSC14-S3N	O	28	KBSC15-S3N	O
29	P5V	I	30	SP-P5V	I
31	SPX-PXP	I	32	SP-GND	I
33	SPY-PXP	I	34	P5V	I

**C.11 CN3240 PAD connector (8-pin)***Table C-11 PAD connector (8-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	SP-P5V	O	2	SPX-PXP	O
3	SPY-PXP	O	4	SP-GND	O
5	SP-GND	-	6	IPDCLK-P5P	I/O
7	IPDDAT-P5P	I/O	8	P5V	I

**C.12 CN3280 Panel sensor connector (3-pin)***Table C-12 Panel sensor connector (3-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	PNLTRN-S3N	O
3	GND	-			

**C.13 CN3400 Debugging connector (4-pin)***Table C-13 Debugging connector (4-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	P3V	-	2	DBGRX-P3P	O
3	DBGTX-P3P	I	4	GND	-

**C.14 J4100 Network I/F connector (14-pin)***Table C-14 Network I/F connector (14-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
A1	BIDAP-PXP	I	A2	BIDAN-PXN	I
A3	BIDBP-PXP	I	A4	BIDCP-PXP	-
A5	BIDCN-PXP	-	A6	BIDBN-PXN	I
A7	BIDDP-PXP	-	A8	BIDDN-PXN	-
A9	LNK-P3N	I	A10	P3V	I
A11	ACT-P3N	I	A12	P3V	I
B1	MDMTIP-E3P	I/O	B2	MDMRNG-E3P	I/O
1T	GND	-	2T	GND	-

**C.15 CN4200 IEEE1394 connector (4-pin)***Table C-15 IEEE1394 connector (4-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	TPB0-E3N	I/O	2	TPB0-E3P	I/O
3	TPA0-E3N	I/O	4	TPA0-E3P	I/O

**C.16 CN4610 USB1 connector (Port 0) (4-pin)***Table C-16 USB1 connector (Port 0) (4-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	USBOPS-E5V	I	2	USBP0-S3N	I
3	USBP0-S3P	I	4	GND	-

**C.17 CN4611 USB2 connector (Port 3) (4-pin)***Table C-17 USB2 connector (Port 3) (4-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	USBOPS-E5V	I	2	USBP3-S3N	I
3	USBP3-S3P	I	4	GND	-

**C.18 CN4612 USB3 connector (Port 6) (6-pin)***Table C-18 USB3 connector (Port 6) (6-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	USBP6-S3N	I	4	USBP6-S3P	I
5	GND	-	6	GND	-

**C.19 CN5501 LCD connector (20-pin)***Table C-19 LCD connector (20-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	TXCK0-PYP	I	4	TXCK1-PYP	I
5	TXCK0-PYN	I	6	TXCK1-PYN	I
7	TXDT0-PYP	I	8	TXDT5-PYN	I
9	TXDT0-PYN	I	10	TXDT5-PYP	I
11	TXDT2-PYN	I	12	TXDT4-PYN	I
13	TXDT2-PYP	I	14	TXDT4-PYP	I
15	TXDT1-PYN	I	16	TXDT6-PYN	I
17	TXDT1-PYP	I	18	TXDT6-PYP	I
19	GND	-	20	GND	-

**C.20 CN6060 Internal microphone (left) connector (2-pin)***Table C-20 Internal microphone (left) connector (2-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	(IMICL-PXP)	O	2	A-GND	-

**C.21 CN6061 Internal microphone (right) connector (2-pin)***Table C-21 Internal microphone (right) connector (2-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	(IMICR-PXP)	O	2	A-GND	-



**C.22 J6070 External microphone connector (6-pin)***Table C-22 External microphone connector (6-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	A-GND	-	4	A-GND	I
2	(MICIN)	O	5	(A4R7-P4V)	I
3	(MICBIS-P2V)	O	6	(MICBIS-P2V)	O

**C.23 CN6150 Speaker connector (4-pin)***Table C-23 Speaker connector (4-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	SP OUT (L-)	I	2	SP OUT (L+)	I
3	SP OUT (R+)	I	4	SP OUT (R-)	I

**C.24 J6310 Headphone connector (6-pin)***Table C-24 Headphone connector (6-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	A-GND	-	2	HEADL-PXP	I
3	HEADR-PXP	I	4	A-GND	-
5	(A4R7-P4V)	I	6	N.C.	-

**C.25 CN8800 DC-IN connector (4-pin)***Table C-25 DC-IN connector (4-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	PVL	O	2	PVL	O
3	GND	-	4	GND	-

**C.26 CN8810 1<sup>st</sup> battery connector (10-pin)***Table C-26 1<sup>st</sup> battery connector (10-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	(PVBL1)	I	2	BTMP1	I
3	(DCHG)	I	4	(M5V)	I
5	PSCL-S5P	I	6	PSDA-S5P	I
7	GND	-	8	DBT10V-S5N	I
9	GND	-	10	GND	-

**C.27 CN9990 RTC battery connector (3-pin)***Table C-27 RTC battery connector (3-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	R3V	O	2	N.C.	-
3	R3V	O			
1T	GND	-	2T	GND	-

**C.28 CN8770 Fan0 connector (3-pin)***Table C-28 Fan0 connector (3-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	(P5V)	I	2	GND	-
3	FANG0-P3P	I			

**C.29 CN8780 Fan1 connector (3-pin)***Table C-29 Fan1 connector (3-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	(P5V)	I	2	GND	-
3	FANG0-P3P	I			

**C.30 CN9502 CN Board I/F connector (40-pin)***Table C-30 CN Board I/F connector (40-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	GND	-	4	GND	-
5	RED-PXP	I	6	TVLUMA-PXP	I
7	GND	-	8	TV-GND	-
9	GREEN-PXP	I	10	TVCHRO-PXP	I
11	GND	-	12	TV-GND	-
13	BLUE-PXP	I	14	SHSYNC-P3P	I
15	GND	-	16	SVSYNC-P3P	I
17	PVON-S5P	I	18	CRTSCL-P5P	I
19	E5V	-	20	CRTSDA-P5P	I
21	GPBTNA-S3N	I	22	GND	-
23	GND	-	24	GND	-
25	GND	-	26	GND	-
27	PNLOFF-S3N	I	28	GND	-
29	USB1PS-E5V	I	30	USBP4-S3N	
31	USB1PS-E5V	I	32	USBP4-S3P	
33	BTMDL-P3N	I	34	GND	-
35	BT-P3V	-	36	BTRST-P3P	O
37	WCHDAT-P3P	O	38	WCHCLK-P3P	I
39	GND	-	40	GND	-

**C.31 CN9540 Digitizer switch I/F connector (40-pin)***Table C-31 Digitizer switch I/F connector (40-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	21	GND	-
2	GND	-	22	DGDTR-P3N	I
3	GND	-	23	DGRTS-P3N	I
4	GND	-	24	DGRXD-P3P	O
5	GND	-	25	DGTXD-P3P	I
6	GND	-	26	GND	-
7	GND	-	27	PCIRS1-S3N	I
8	GND	-	28	P3V	I
9	GND	-	29	GND	-
10	GND	-	30	PWRSW-S3N	O
11	GND	-	31	GND	-
12	PNL2-P3P	O	32	KBRT00-S3N	O
13	BRT1-P5P	I	33	KBRT01-S3N	O
14	BRT2DA-S3P	I	34	KBRT02-S3N	O
15	BRT0-P5P	I	35	KBRT03-S3N	O
16	FL-P5V	I	36	KBRT04-S3N	O
17	PNL-P3V	I	37	KBRT05-S3N	O
18	FL-P5V	I	38	KBRT06-S3N	O
19	PNL-P3V	I	39	GND	-
20	FL-P5V	I	40	KBSC16-S3N	I

**CN board**

**C.32 CN4400 Bluetooth I/F connector (20-pin)**

*Table C-32 Bluetooth I/F connector (20-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	N.C.	-
3	BTMDL-P3N	O	4	N.C.	-
5	N.C.	-	6	N.C.	-
7	N.C.	-	8	BTRST-S3P	I
9	N.C.	-	10	N.C.	-
11	GND	-	12	N.C.	-
13	(GND)	I	14	WCHCLK-P3P	O
15	N.C.	-	16	USBP4-S3P	I/O
17	USBBP4-S3N	I/O	18	WCHDAT-P3P	I
19	N.C.	-	20	BT-P3V	-
1T	GND	-	2T	GND	-

**C.33 CN4621 USB I/F connector (for relay of port 6) (6-pin)**

*Table C-33 USB I/F connector (for relay of port 6) (6-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	- side	I/O	4	+ side	I/O
5	GND	-	6	GND	-

**C.34 CN4620 USB I/F connector (port 6) (4-pin)***Table C-34 USB I/F connector (port 6) (4-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	USB1PS-E5V	I	2	+ side	I/O
3	- side	I/O	4	GND	-
1T	GND	-	2T	GND	-
3T	GND	-			

**C.35 CN5320 CRT I/F connector (15-pin)***Table C-35 CRT I/F connector (15-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	MRED-PXP	I	2	MGREEN-PXP	I
3	MBLUE-PXP	I	4	N.C	-
5	GND	-	6	VGAGND	-
7	GND	-	8	GND	-
9	DDC-P5V	I	10	GND	-
11	N.C	-	12	CRTSDA-P5P	I
13	SHSYNC-P3P	I	14	SVSYNC-P3P	I
15	CRTSCL-P5P	I			

**C.36 CN5340 S-VIDEO I/F connector (4-pin)***Table C-36 S-VIDEO I/F connector (4-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	LUMINA-PYP	I	4	CHROMA-PYP	I
1T	GND	-	2T	GND	-
3T	GND	-	4T	GND	-

**C.37 CN9521 QI board I/F connector (2-pin)***Table C-37 QI board I/F connector (2-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GPBTNA-S3N	I	2	GND	-

**C.38 CN9523 MG board I/F connector (3-pin)***Table C-38 MG board I/F connector (3-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	PNLOFF-S3N	I	2	N.C.	-
3	GND	-			

**C.39 CN9520 System board I/F connector (40-pin)***Table C-39 System board I/F connector (40-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GND	-	2	GND	-
3	GND	-	4	GND	-
5	MRED-PXP	I	6	TVLUMA-PXP	I
7	GND	-	8	TV-GND	-
9	MGREEN-PXP	I	10	TVCHRO-PXP	I
11	GND	-	12	TV-GND	-
13	MBLUE-PXP	I	14	SHSYNC-P3P	I
15	GND	-	16	SVSYNC-P3P	I
17	PVON-S5P	I	18	CRTSCL-P5P	I
19	E5V	-	20	CRTSDA-P5P	I
21	GPBTNA-S3N	I	22	GND	-
23	GND	-	24	GND	-
25	GND	-	26	GND	-
27	PNLOFF-S3N	I	28	GND	-
29	USB1PS-E5V	I	30	USBP4-S3N	
31	USB1PS-E5V	I	32	USBP4-S3P	
33	BTMDL-P3N	I	34	GND	-
35	BT-P3V	-	36	BTRST-P3P	O
37	WCHDAT-P3P	O	38	WCHCLK-P3P	I
39	GND	-	40	GND	-



**QI board****C.40 CN9530 CN board I/F connector (2-pin)***Table C-40 CN board I/F connector (2-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	GPBTNA-S3N	I	2	GND	-

**SW board****C.41 CN9510 System board I/F connector (12-pin)***Table C-41 System board I/F connector (12-pin)*

Pin No.	Signal Name	I/O	Pin No.	Signal Name	I/O
1	PWRSW-S3N	I	7	KBRT03-S3N	O
2	GND	-	8	KBRT04-S3N	O
3	KBSC16-S3N	I	9	KBRT05-S3N	O
4	KBRT00-S3N	O	10	KBRT06-S3N	O
5	KBRT01-S3N	O	11	GND	-
6	KBRT02-S3N	O	12	GND	-

## Appendix D Keyboard Scan/Character Codes

Table D-1 Scan codes (set 1 and set 2) (1/4)

Cap No.	Keytop	Code set 1		Code set 2		Note	
		Make	Break	Make	Break		
01	' ~	29	A9	0E	F0	0E	
02	1 !	02	82	16	F0	16	
03	2 @	03	83	1E	F0	1E	
04	3 #	04	84	26	F0	26	
05	4 \$	05	85	25	F0	25	
06	5 %	06	86	2E	F0	2E	
07	6 ^	07	87	36	F0	36	
08	7 &	08	88	3D	F0	3D	*2
09	8 *	09	89	3E	F0	3E	*2
10	9 (	0A	8A	46	F0	46	*2
11	0 )	0B	8B	45	F0	45	*2
12	- _	0C	8C	4E	F0	4E	
13	= +	0D	8D	55	F0	55	
15	BkSp	0E	8E	66	F0	66	
16	Tab	0F	8F	0D	F0	0D	
17	Q	10	90	15	F0	15	
18	W	11	91	1D	F0	1D	
19	E	12	92	24	F0	24	
20	R	13	93	2D	F0	2D	
21	T	14	94	2C	F0	2C	
22	Y	15	95	35	F0	35	
23	U	16	96	3C	F0	3C	*2
24	I	17	97	43	F0	43	*2
25	O	18	98	44	F0	44	*2
26	P	19	99	4D	F0	4D	*2
27	[ {	1A	9A	54	F0	54	
28	] }	1B	9B	5B	F0	5B	

Table D-1 Scan codes (set 1 and set 2) (2/4)

Cap No.	Keytop	Code set 1		Code set 2		Note
		Make	Break	Make	Break	
29	\	2B	AB	5D	F0 5D	*5
30	Caps Lock	3A	BA	58	F0 58	
31	A	1E	9E	1C	F0 1C	
32	S	1F	9F	1B	F0 1B	
33	D	20	A0	23	F0 23	
34	F	21	A1	2B	F0 2B	
35	G	22	A2	34	F0 34	
36	H	23	A3	33	F0 33	
37	J	24	A4	3B	F0 3B	*2
38	K	25	A5	42	F0 42	*2
39	L	26	A6	4B	F0 4B	*2
40	; :	27	A7	4C	F0 4C	*2
41	' "	28	A8	52	F0 52	
43	Enter	1C	9C	5A	F0 5A	*3
44	Shift (L)	2A	AA	12	F0 12	
45	No.102 key	56	D6	61	F0 61	
46	Z	2C	AC	1A	F0 1A	
47	X	2D	AD	22	F0 22	
48	C	2E	AE	21	F0 21	
49	V	2F	AF	2A	F0 2A	
50	B	30	B0	32	F0 32	
51	N	31	B1	31	F0 31	
52	M	32	B2	3A	F0 3A	*2
53	, <	33	B3	41	F0 41	*2
54	. >	34	B4	49	F0 49	*2
55	/ ?	35	B5	4A	F0 4A	*2
57	Shift (R)	36	B6	59	F0 59	

Table D-1 Scan codes (set 1 and set 2) (3/4)

Cap No.	Keytop	Code set 1		Code set 2			Note
		Make	Break	Make	Break		
58	Ctrl	1D	9D	14	F0	14	*3
60	Alt (L)	38	B8	11	F0	11	*3
61	Space	39	B9	29	F0	29	
62	ALT (R)	E0 38	E0 B8	E0 11	E0 F0	11	
75	Ins	E0 52	E0 D2	E0 70	E0 F0	70	*1
76	Del	E0 53	E0 D3	E0 71	E0 F0	71	*1
79	←	E0 4B	E0 CB	E0 6B	E0 F0	6B	*1
80	Home	E0 47	E0 C7	E0 6C	E0 F0	6C	*1
81	End	E0 4F	E0 CF	E0 69	E0 F0	69	*1
83	↑	E0 48	E0 C8	E0 75	E0 F0	75	*1
84	↓	E0 50	E0 D0	E0 72	E0 F0	72	*1
85	PgUp	E0 49	E0 C9	E0 7D	E0 F0	7D	*1
86	PgDn	E0 51	E0 D1	E0 7A	E0 F0	7A	*1
89	→	E0 4D	E0 CD	E0 74	E0 F0	74	*1
110	Esc	01	81	76	F0	76	
112	F1	3B	BB	05	F0	05	
113	F2	3C	BC	06	F0	06	
114	F3	3D	BD	04	F0	04	
115	F4	3E	BE	0C	F0	0C	
116	F5	3F	BF	03	F0	03	
117	F6	40	C0	0B	F0	0B	
118	F7	41	C1	83	F0	83	
119	F8	42	C2	0A	F0	0A	
120	F9	43	C3	01	F0	01	
121	F10	44	C4	09	F0	09	*3

Table D-1 Scan codes (set 1 and set 2) (4/4)

Cap No.	Keytop	Code set 1				Code set 2				Note
		Make		Break		Make		Break		
122	F11	57		D7		78		F0	78	*3
123	F12	58		D8		07		F0	07	*3
124	PrintSc	*6		*6		*6		*6		*6
126	Pause	*7		*7		*7		*7		*7
202	Fn	—		—		—		—		*4
203	Win	E0	5B	E0	DB	E0	1F	E0	F0	1F
204	App	E0	5D	E0	DD	E0	2F	E0	F0	2F

**Notes:**

1. \* Scan codes differ by mode.
2. \* Scan codes differ by overlay function.
3. \* Combination with the **Fn** key makes different codes.
4. \* **Fn** key does not generate a code by itself.
5. \* This key corresponds to key No. 42 in a 102-key model.
6. \* Refer to Table D-6, No. 124 key scan code.
7. \* Refer to Table D-7, No. 126 key scan code.

Table D-2 Scan codes with left Shift key

Cap No.	Key top	Code set 1				Code set 2			
		Make		Break		Make		Break	
55	/	E0 AA	E0 35	E0 B5	E0 2A	E0 F0	12 E0 4A	E0 F0	4A E0 12
75	INS	E0 AA	E0 52	E0 D2	E0 2A	E0 F0	12 E0 70	E0 F0	70 E0 12
76	DEL	E0 AA	E0 53	E0 D3	E0 2A	E0 F0	12 E0 71	E0 F0	71 E0 12
79	←	E0 AA	E0 4B	E0 CB	E0 2A	E0 F0	12 E0 6B	E0 F0	6B E0 12
80	Home	E0 AA	E0 47	E0 C7	E0 2A	E0 F0	12 E0 6C	E0 F0	6C E0 12
81	End	E0 AA	E0 4F	E0 CF	E0 2A	E0 F0	12 E0 69	E0 F0	69 E0 12
83	↑	E0 AA	E0 48	E0 C8	E0 2A	E0 F0	12 E0 75	E0 F0	75 E0 12
84	↓	E0 AA	E0 50	E0 D0	E0 2A	E0 F0	12 E0 72	E0 F0	72 E0 12
85	PgUp	E0 AA	E0 49	E0 C9	E0 2A	E0 F0	12 E0 7D	E0 F0	7D E0 12
86	PgDn	E0 AA	E0 51	E0 D1	E0 2A	E0 F0	12 E0 7A	E0 F0	7A E0 12
89	→	E0 AA	E0 4D	E0 CD	E0 2A	E0 F0	12 E0 74	E0 F0	74 E0 12
203	Win	E0 AA	E0 5B	E0 DB	E0 2A	E0 F0	12 E0 1F	E0 F0	1F E0 12
204	App	E0 AA	E0 5D	E0 DD	E0 2A	E0 F0	12 E0 2F	E0 F0	2F E0 12

**Note :** The table above shows scan codes with the left **Shift** key. In combination with the right **Shift** key, scan codes are changed as listed below:

	With left <b>Shift</b>	With right <b>Shift</b>
Set 1	E0 AA _____	E0 B6
	E0 2A _____	E0 36
Set 2	E0 F0 12 _____	E0 F0 59
	E0 12 _____	E0 59

Table D-3 Scan codes in Numlock mode

Cap No.	Key top	Code set 1								Code set 2									
		Make				Break				Make				Break					
75	INS	E0	2A	E0	52	E0	D2	E0	AA	E0	12	E0	70	E0	F0	70	E0	F0	12
76	DEL	E0	2A	E0	53	E0	D3	E0	AA	E0	12	E0	71	E0	F0	71	E0	F0	12
79	←	E0	2A	E0	4B	E0	CB	E0	AA	E0	12	E0	6B	E0	F0	6B	E0	F0	12
80	Home	E0	2A	E0	47	E0	C7	E0	AA	E0	12	E0	6C	E0	F0	6C	E0	F0	12
81	End	E0	2A	E0	4F	E0	CF	E0	AA	E0	12	E0	69	E0	F0	69	E0	F0	12
83	↑	E0	2A	E0	48	E0	C8	E0	AA	E0	12	E0	75	E0	F0	75	E0	F0	12
84	↓	E0	2A	E0	50	E0	D0	E0	AA	E0	12	E0	72	E0	F0	72	E0	F0	12
85	PgUp	E0	2A	E0	49	E0	C9	E0	AA	E0	12	E0	7D	E0	F0	7D	E0	F0	12
86	PgDn	E0	2A	E0	51	E0	D1	E0	AA	E0	12	E0	7A	E0	F0	7A	E0	F0	12
89	→	E0	2A	E0	4D	E0	CD	E0	AA	E0	12	E0	74	E0	F0	74	E0	F0	12
203	Win	E0	2A	E0	5B	E0	DB	E0	AA	E0	12	E0	1F	E0	F0	1F	E0	F0	12
204	App	E0	2A	E0	5D	E0	DD	E0	AA	E0	12	E0	2F	E0	F0	2F	E0	F0	12

Table D-4 Scan codes with Fn key

Cap No.	Keytop	Code set 1				Code set 2				
		Make		Break		Make		Break		
43	ENT	E0	1C	E0	9C	E0	5A	E0	F0	5A
58	CTRL	E0	1D	E0	9D	E0	14	E0	F0	14
60	LALT	E0	38	E0	B8	E0	11	E0	F0	11
121	ARROW		45		C5		77		F0	77
122	NUMERIC		45		C5		77		F0	77
123	Scrl		46		C5		7E		F0	7E

Table D-5 Scan codes in overlay mode

Cap No.	Keytop	Code set 1				Code set 2			
		Make		Break		Make		Break	
08	7 (7)	47		C7		6C		F0 6C	
09	8 (8)	48		C8		75		F0 75	
10	9 (9)	49		C9		7D		F0 7D	
11	0 (*)	37		B7		7C		F0 7C	
23	U (4)	4B		CB		6B		F0 6B	
24	I (5)	4C		CC		73		F0 73	
25	O (6)	4D		CD		74		F0 74	
26	P (-)	4A		CA		7B		F0 7B	
37	J (1)	4F		CF		69		F0 69	
38	K (2)	50		D0		72		F0 72	
39	L (3)	51		D1		7A		F0 7A	
40	; (+)	4E		CE		79		F0 79	
52	M (0)	52		D2		70		F0 70	
54	. (.)	53		D3		71		F0 71	
55	/ (/)	E0 35	E0 B5	40 4A	E0 F0 4A				

Table D-6 No.124 key scan code

Key top	Shift	Code set 1				Code set 2			
		Make		Break		Make		Break	
Prt Sc	Common	E0 2A	E0 37	E0 B7	E0 AA	E0 12	E0 7C	E0 F0 7C	E0 F0 12
	Ctrl+	E0 37		E0 B7		E0 7C		E0 F0 7C	
	Shift+	E0 37		E0 B7		E0 7C		E0 F0 7C	
	Alt+	54		D4		84		F0 B4	



Table D-7 No.126 key scan code

Key top	Shift	Code set 1						Code set 2							
		Make						Make							
Pause	Common*	E1	1D	45	E1	9D	C5	E1	14	77	E1	F0	14	F0	77
	Ctrl*	E0	46	E0	C6			E0	7E	E0	F0	7E			

\*: This key generates only make codes.

## Appendix E Key Layout

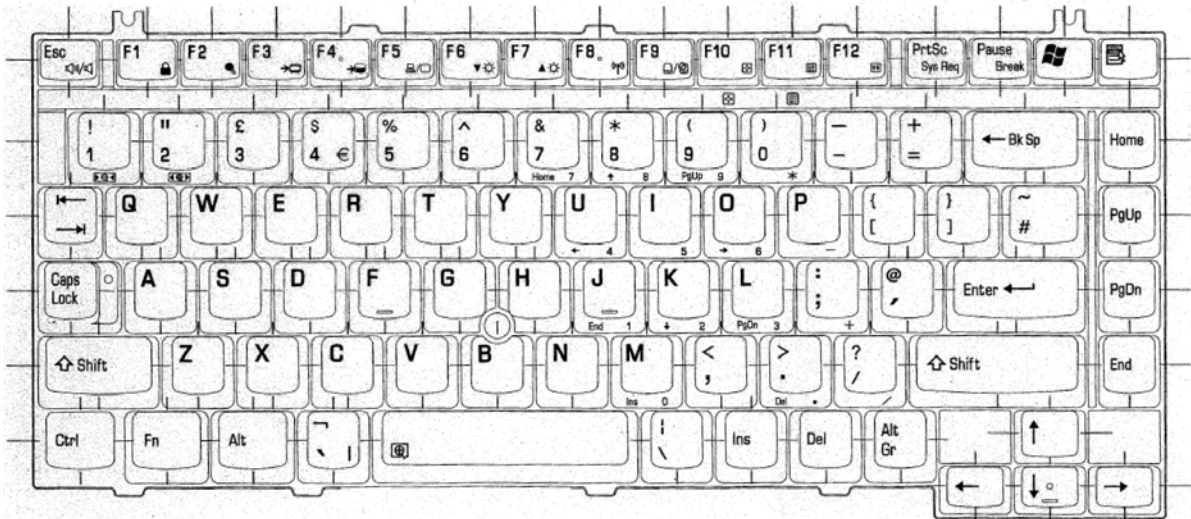


Figure E-1 Key layout (UK)

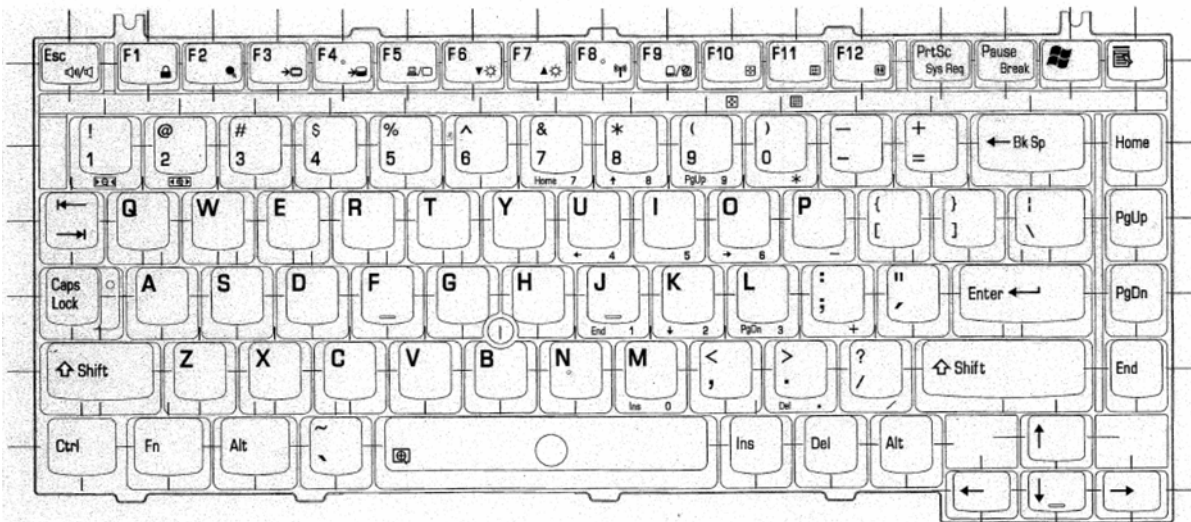


Figure E-2 Key layout (US)

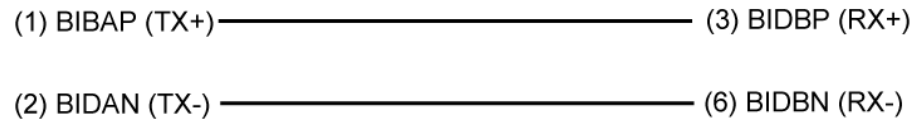


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## Appendix F Wiring Diagrams

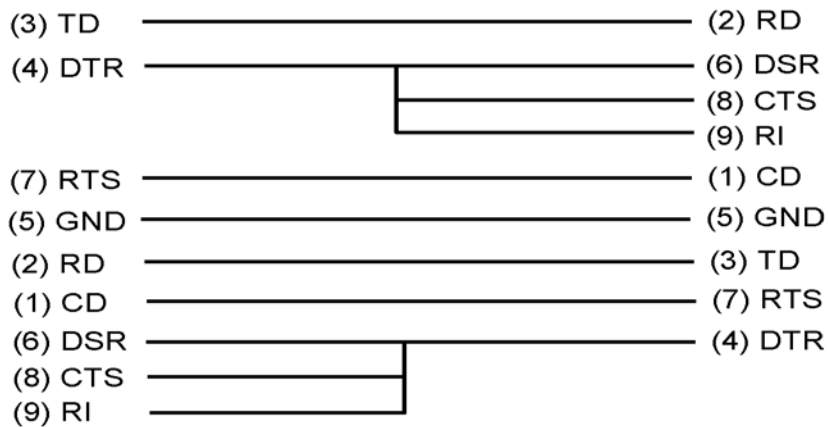
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### F.1 LAN Loopback Connector



*Figure F-1 LAN loopback Connector*

### F.2 RS-232C Cable (9-pin to 9-pin)



*Figure F-2 RS-232C cable (9-pin to 9-pin)*

### F.3 RS-232C Cable (9-pin to 25-pin)

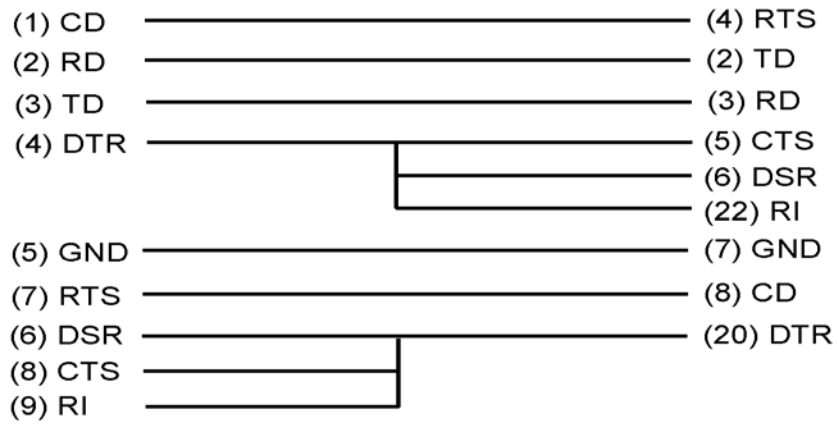


Figure F-3 RS-232C cable (9-pin to 25-pin)

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## Appendix G BIOS Rewrite Procedures

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This Appendix explains how to rewrite the system BIOS program when you update the system BIOS.

### Tools



To rewrite the BIOS, you need the following tool:

- BIOS rewriting disk for the computer that has renewed BIOS data.

### Rewriting the BIOS

**Note:**

1. Connect the AC adaptor to the computer when you rewrite the BIOS.
2. Do not turn off the power while you are rewriting the BIOS.  
*If the rewrite fails, it might be impossible to start up the computer.*
3. *If you fail to rewrite BIOS, then when you next turn on the power, a message may be displayed that the contents of the BIOS have been damaged. In this case, insert the BIOS rewriting disk and the BIOS will be rewritten.*

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cable and PC card.
4. Connect a USB FDD and insert the BIOS rewriting disk into either the USB FDD.
5. Turn on the power while holding down the  key (US) or  key (UK).  
The BIOS rewriting starts.
6. When the process is completed, eject the BIOS rewriting disk and the system is reset.



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## Appendix H EC/KBC Rewrite Procedures

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This Appendix explains how to rewrite the EC/KBC system program when you update the EC/KBC system.

### Tools

To rewrite the EC/KBC, you need the following tool:

- EC/KBC rewriting disk for the computer

### Rewriting the EC/KBC

- NOTE:**
1. Rewrite the EC/KBC only when instructed by a diagnostic disk release notice.
  2. Be sure to connect both battery and AC adapter to the computer when you rewrite the EC/KBC.
  3. Do not turn off the power while you are rewriting the EC/KBC. If the rewrite fails, it might be impossible to start up the computer.
  4. If you fail to rewrite EC/KBC, then when you next turn on the power, a message may be displayed that the content of the EC/KBC has been erased. In this case, insert the EC/KBC rewriting disk, and the EC/KBC will be rewritten.
  5. The time of rewriting EC/KBC depends on the conditions of the computer or ICs. The computer is not hung up. Allow sufficient time. Never reboot or turn off the power to the computer before the rewriting is completed.

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cable and PC Card.
4. Connect a USB FDD and insert the EC/KBC rewriting disk into the USB FDD.
5. Turn on the power while holding down the **Tab** key. The EC/KBC rewriting starts.
6. When the EC/KBC rewrite is completed, the system is automatically turned off.





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## Appendix I Reliability

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The following table shows MTBF (Mean Time between Failures).

*Table I-1 MTBF*

<b>MTBF</b>	<b>Time (hours)</b>
System	5,141

